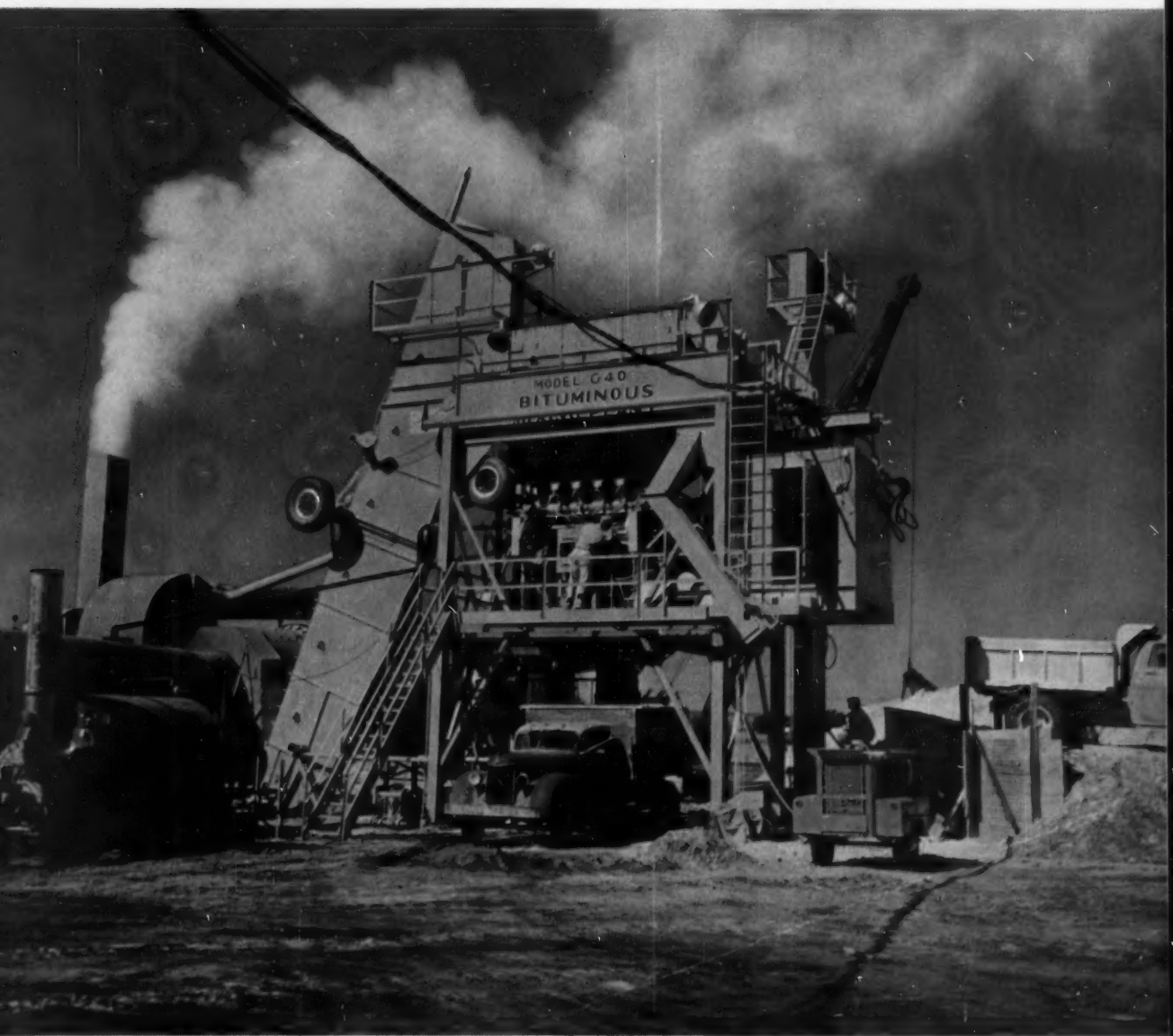
50 CENTS

CONSTRUCTION METHODS AND EQUIPMENT

June 1956



A 4,000-lb batch plant pours out asphaltic hot-mix for Peter Kiewit Sons' Co. on a Nebraska highway job. (See p. 2)

A McGRAW-HILL PUBLICATION

tough digging

tough wire rope

Yellow Strand Flattened Strand

Yellow Strand Flattened Strand is used by Donlon Construction Co., Nashville, Tenn., in this ¾ yard backhoe on tough rock cut for sewer line.

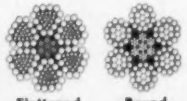
Here's the wire rope designed for the shock, pull, jerk of digging in rock. It's Yellow Strand Flattened Strand shown working for Donlon Construction Co., Nashville, Tenn. Donlon is cutting a 15-foot deep cut—most of which is rock—in preparation for laying a 15-inch sewer line. Donlon chose Yellow Strand Flattened Strand for the job because they knew it would stand up longer . . . take more abuse . . . turn in more profitable work under these rugged conditions. The Superintendent on the job, Clyde Fuqua, reports, "There's less breakage by using Flattened Strand Yellow Strand."

Superintendents on tough jobs everywhere will tell you the same story. Here's why! Yellow Strand Flattened Strand is formed of strands laid up in triangular form. The design gives a smoother outer surface with more contact points, less abrasion. With Flattened Strand, you also get 10% greater strength, greater compactness for longer, more profitable life under toughest conditions.

So, if constant wire rope failure and breakage on tough jobs are robbing you of profits . . . switch now to Yellow Strand Flattened Strand. Your B & B Distributor will give you more reasons why you should.

COMPARE

Yellow Strand Flattened Strand with Round Strand Wire Rope. In Flattened Strand you have twelve contact points, greater bearing area, smoother surface, less wear. Result: longer service, lower final cost!



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Birmingham, Ala.	4-0364	Columbus, Ohio	AM 8-9631	Jacksonville, Fla.	EL 8-4187	New Orleans, La.	CA 6341	St. Louis, Mo.	PR 3-2600
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5663

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PROTO means PROfessional TOols

CONSTRUCTION

Volume 38
Number 6

METHODS AND EQUIPMENT

Established 1919

June 1956

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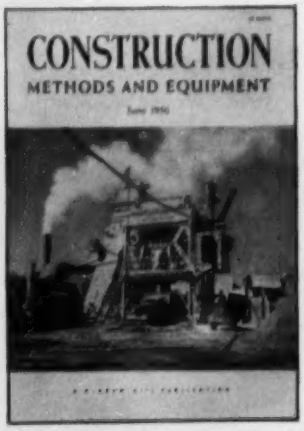

On the Cover

Peter Kiewit Sons Co. turns out asphalt mix at Julien, Neb., for a highway job south of Nebraska City with this 4,000-lb portable Cedarapids G40 Bituminous Mixing Plant. Except for the dust collector, all units of the plant set-up are electrially powered. A Detroit Diesel Engine generator unit supplies power.

CONCRETE WORK

Any contractor who does concrete work will find CM&E's series of articles on Concrete Mixing and Placing useful. Reprints are available in booklet form. Single copies are 50¢; for orders of 10 copies or more, the price is 40¢ each. Address your order to the Editor.

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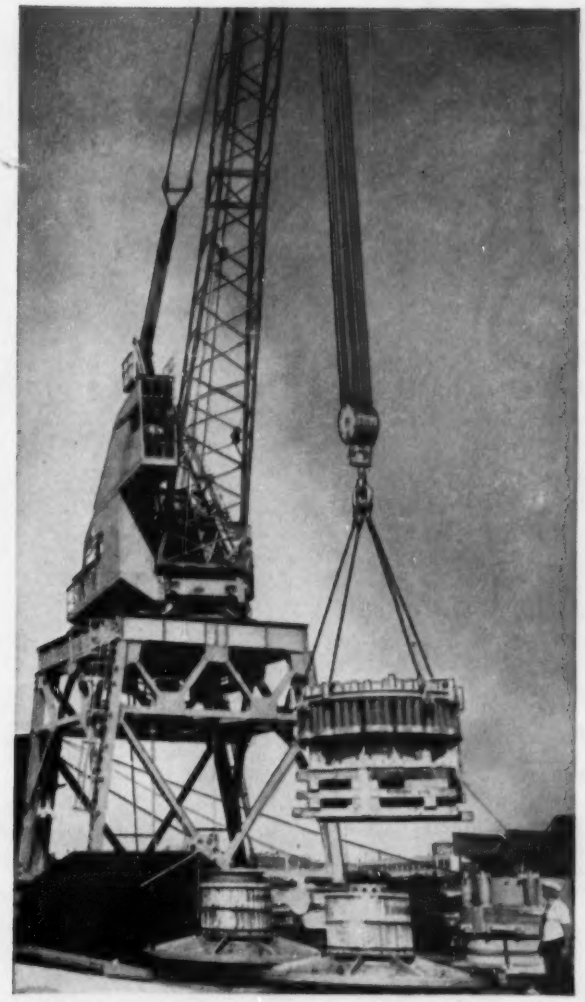

Whatever your needs, Macwhyte makes the sling, wire rope, or assembly for your equipment. Here, two ATLAS Assembly E-2, Round-Braided Slings handle cargo. These balanced braided slings have an excellent reputation for safe, fast, easy handling.

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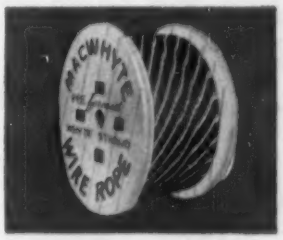

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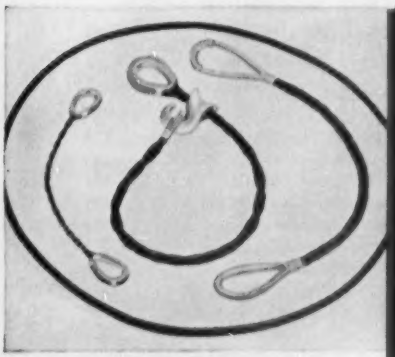

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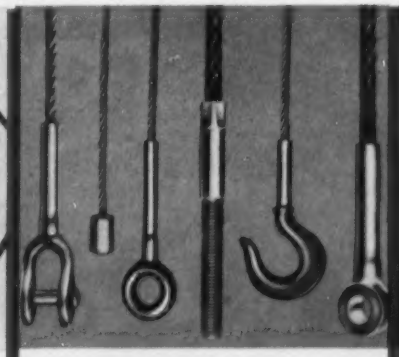

WIRE ROPE ASSEMBLIES. Macwhyte Safe-Lock Wire Rope Assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. A wide selection of fittings are made in strengths from 500 to 85,000 lbs. and up. *Request Catalog 5601.*

WIRE ROPE. There are *a thousand and one* sizes and types of Internally Lubricated Macwhyte wire rope to give you the *right* rope for any equipment need. *Catalog G-16 lists all wire rope classifications and sizes, as well as general information on use and handling.*

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Pay Dirt in This Issue

June, 1956

How to Build a Draft-Tube Form 58

Mass production techniques help contractor cut costs on complex draft-tube forms for Buford Dam powerhouse.

Freezing Piles in Place in Alaska 62

A refrigeration system freezes 900 piles in place to support the main building at Bethel Air Force Station.

A Unique Bracing Method 65

To brace the adjoining party wall, contractor decides to top out his building, then complete its foundation.

Laying a Pipeline by Land, Air, Sea 70

Helicopters, pipelaying barges, and dry land equipment all play a part in laying a long Gulf Coast pipeline.

Pretensioned Piles Are 132 ft Long 72

A San Francisco pier modernization job involves casting and placing some of the longest piles on record.

Altered Hoe Digs 'On the Money' 91

By mounting shipper shaft in trolley that can move dipper stick along boom, contractor increases rig's value.

Cable-Riding Rig Rehangs Bridge Deck 99

Mobile scaffolds with hoisting devices do a fast job of rehabilitating New York's old Manhattan Bridge.

Japanese Dam Rises Across Canyon 124

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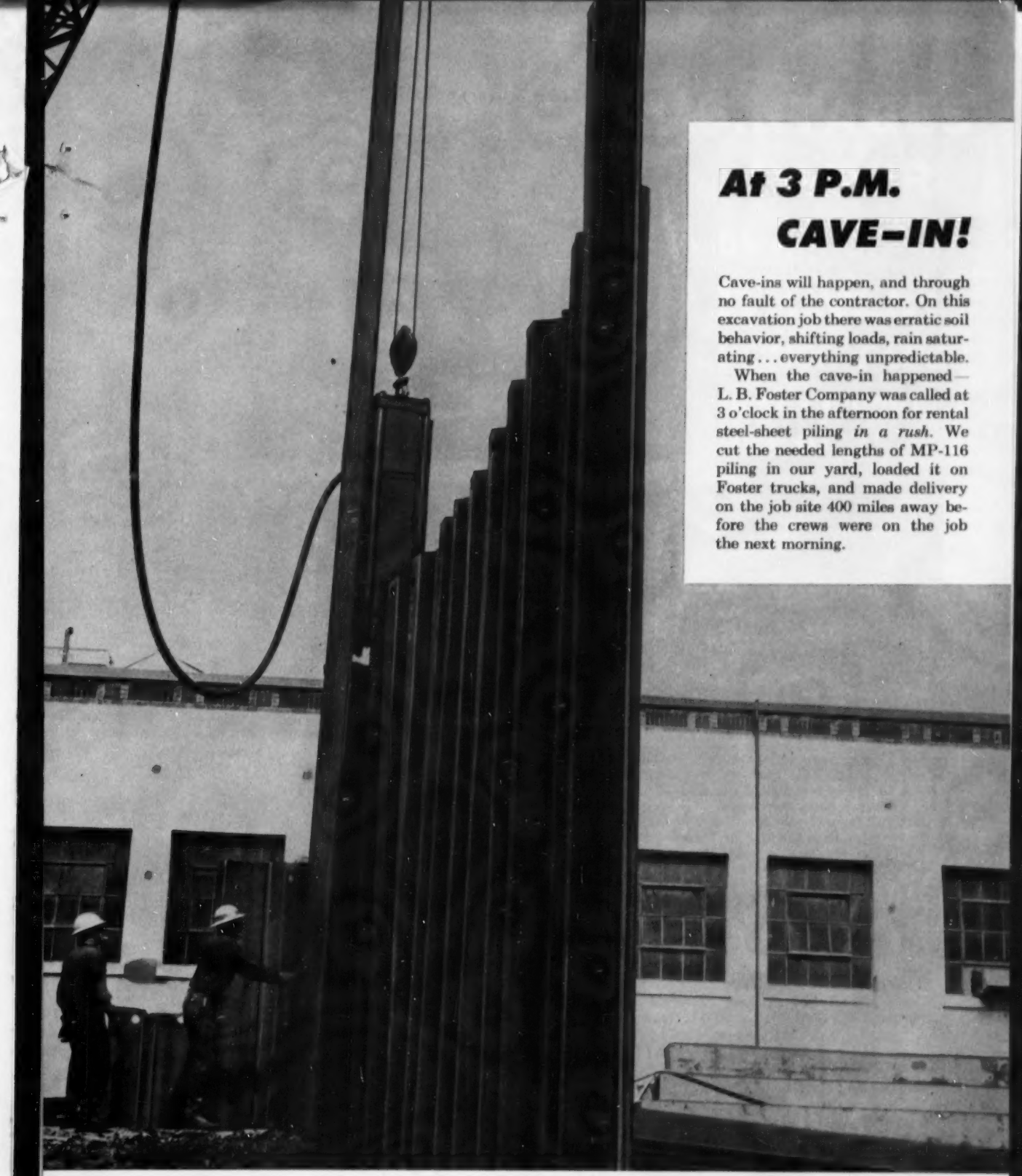
NEXT MONTH

The July issue of CONSTRUCTION METHODS will be a contractor's Guide to Equipment Maintenance. It will contain information every contractor needs to keep his equipment productive for long periods of time at the lowest cost and, in addition, a complete listing of service manuals.



At 3 P.M. CAVE-IN!

Cave-ins will happen, and through no fault of the contractor. On this excavation job there was erratic soil behavior, shifting loads, rain saturating . . . everything unpredictable.

When the cave-in happened—L. B. Foster Company was called at 3 o'clock in the afternoon for rental steel-sheet piling *in a rush*. We cut the needed lengths of MP-116 piling in our yard, loaded it on Foster trucks, and made delivery on the job site 400 miles away before the crews were on the job the next morning.

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(Advertisement)

STRIP ACT AT ONLY 1200 RPM: To join new and old bridge structures on the $8,527,000 Spring-Sandusky Interchange, at Columbus, Ohio, required demolition of the existing deck. Seven air tools (3 medium sinkers, 3 heavy duty breakers and a heavy chipping hammer) were supplied by a Jaeger "600" Rotary which never ran faster than 1200 rpm. Visintine & Company, contractors.

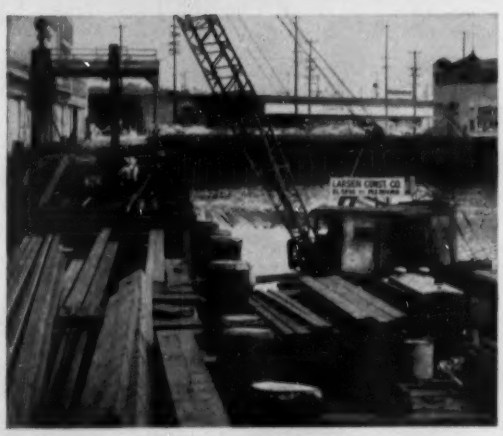
IDLING AT ONLY 900 RPM, on this road job, the Jaeger "600" Rotary is operating these four Thor "75" rock drills at 100 lbs. pressure. Under all ordinary conditions the same compressor will hold full pressure in two heavy duty wagon drills while operating well below its full load speed of 1650 rpm. "It's a windjamming sonofagun" says John Newman, Orco Construction president, Kirkwood, Mo.

Why air costs you less with a Jaeger Roto®

Full load speed of other "600" rotary compressors is as high as 1800 rpm. Full load speed of the Jaeger Rotary is 1650 rpm, using the same economical GM 6-71 diesel engine. This difference means that, for the lengthened life of your compressor, you will produce air with less fuel, with fewer feet of engine piston travel and up to 150 fewer compressor revolutions per minute.

Further improvement in efficiency results from Jaeger's closer regulation of engine and compressor to air demands. Speed modulation over the entire range is smooth and stepless, and so instantaneous as to prevent any over-run and racing of engine.

Jaeger "125" and "365" Roto Air Plus units offer comparably superior performance. For complete details, see your Jaeger distributor or send for Catalog JCR-5.



SMOOTH AS STEAM, AT A FUEL-SAVING 1200 RPM: A Jaeger "600" Rotary and Union #1 hammer here team up to drive 75' pilings of 14" - 16" diameter at Port of Seattle unloading dock. Never running faster than a fuel-saving, compressor-saving 1200 rpm, the compressor maintained a hammer speed of 120 blows per minute. Average penetration was ½". At ¼" penetration, driving was stopped. Larsen Construction Co., contractors.

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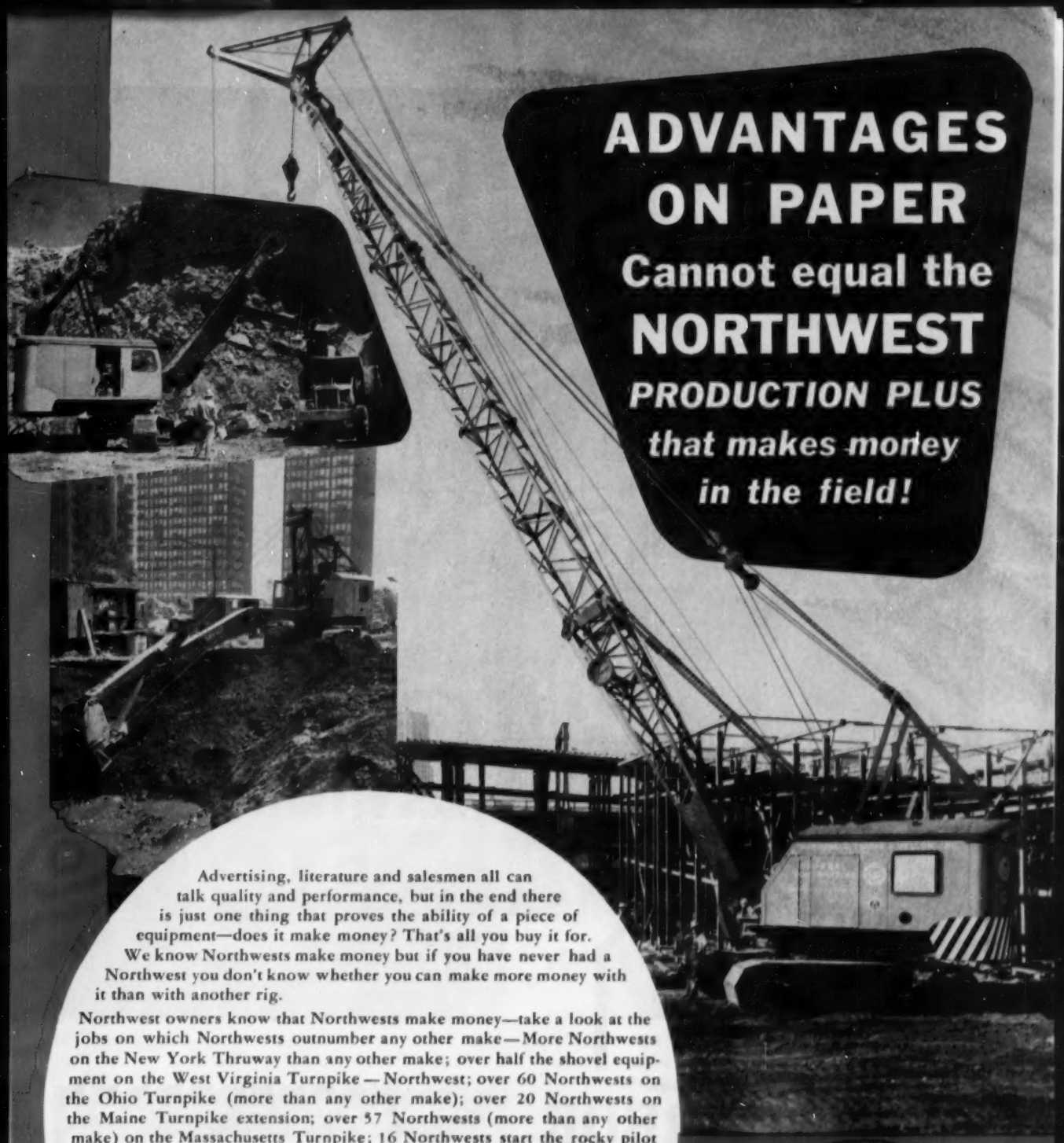

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Northwest owners know that Northwests make money—take a look at the jobs on which Northwests outnumber any other make—More Northwests on the New York Thruway than any other make; over half the shovel equipment on the West Virginia Turnpike—Northwest; over 60 Northwests on the Ohio Turnpike (more than any other make); over 20 Northwests on the Maine Turnpike extension; over 57 Northwests (more than any other make) on the Massachusetts Turnpike; 16 Northwests start the rocky pilot work on the Kansas Turnpike; over 35 Northwests on the St. Lawrence Seaway—and we could go on and on. This plus the fact that one out of every three Northwests sold is a repeat order in the hands of a responsible contractor, demonstrates the *production plus* that Northwests give—service that means output and profit—service that *makes money in the field.*

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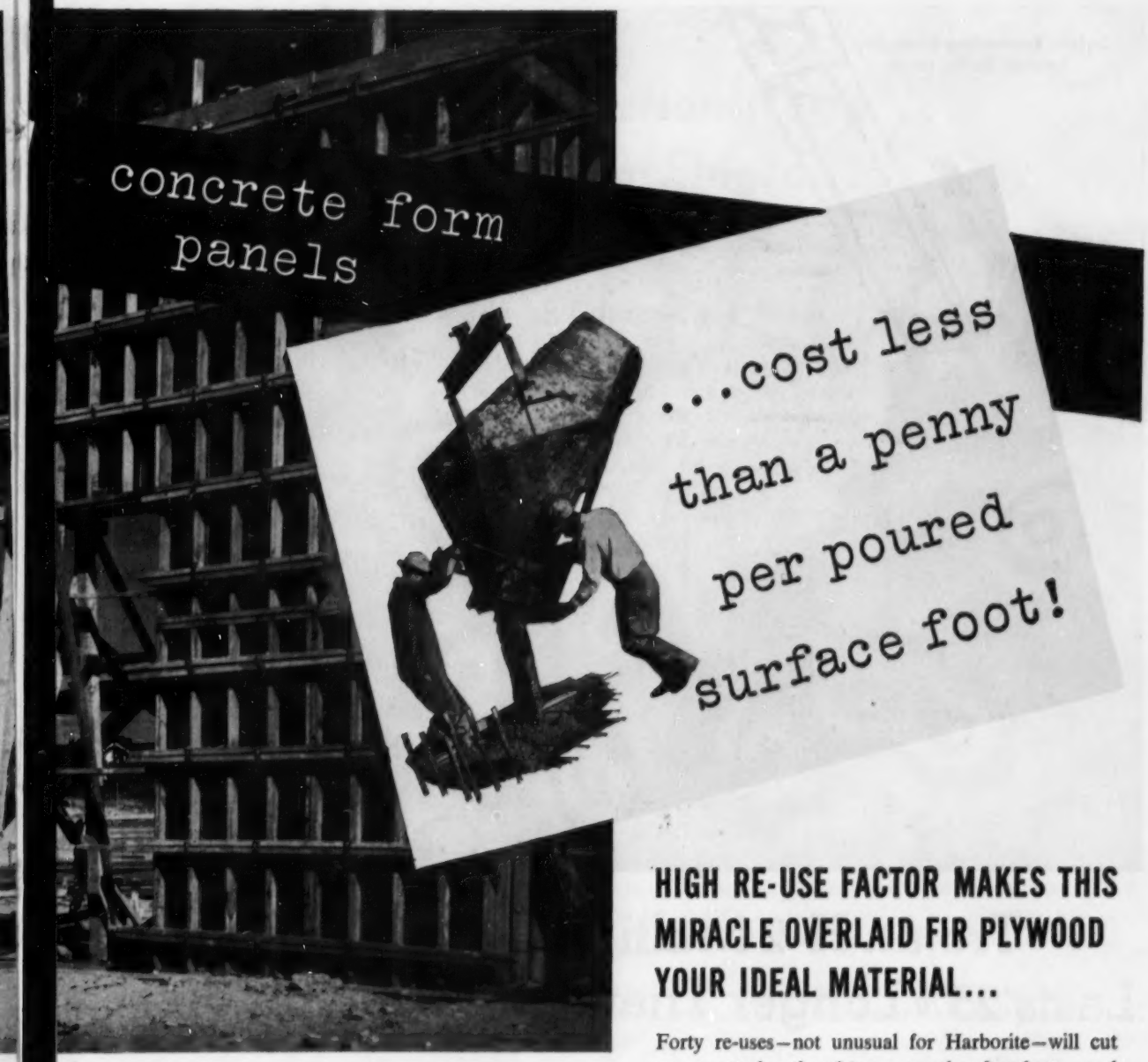

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	PLYFORM	HARBORITE	MATERIAL YOU NOW USE
WAREHOUSE COST PER FOOT*	$.242	$.308	
AVERAGE NUMBER OF RE-USES	10	40	
COST PER POURED SURFACE FOOT	$.0242	$.0077	

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Around Council Bluffs, when there's earth to be moved, Dofner's the man. Excavating for roads, house, or building construction, he keeps his 21 dump trucks and other equipment in constant operation to fulfill his heavy job schedule.

But you'd never know this by the amount of gasolene or lubrication required. "The fact is," says Dofner, "I've found Cities Service Trojan H-2 Multi-Purpose Grease lasts 25% longer than any other grease I've ever used. And my dump trucks are actually running an average of 10 hours apiece and getting as high as 20 loads on one tankful of Cities Service Gasolene. Needless to say, I'm sold on Cities Service!"

Again and again, Cities Service receives reports such as this from construction men. If you'd like to know the reasons why, talk with a Cities Service Lubrication Engineer. Or write Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

MORE OF DOFNER'S EQUIPMENT AT WORK. Although he keeps it in almost constant operation, Dofner reports he's never lost a bearing and goes 25% longer between greasings since he switched to Trojan H-2 Multi-Purpose Grease.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Construction News from Washington . . .

Washington, D.C.
June, 1956

Highway Construction Boom Begins

The muti-billion highway program is scheduled to get under way beginning July 1. New and higher taxes to be paid by highway users—on gasoline, diesel fuel, trucks, tires, camelback—become effective immediately. The money goes into a trust fund from which billions will be parceled out to the states to improve the 40,000-mile interstate highway network.

Allocations to the states will go out quickly so they can go ahead with their plans—picking new routes where needed, acquiring right-of-way, and the like.

States already have plans for hundreds of millions of dollars worth of highways so they can advertise for bids very quickly. Bid invitations will be published in July for business that would not be available except for the new law. State highway departments will be in charge, as they have been under previous laws.

Highway Builders Can Handle the Load

The new federal aid money will push highway construction to new peaks: the plan calls for Federal grants to hit as high as $3.2 billion per year, compared to the present level of about $1 billion. Total roadbuilding by all agencies—state, Federal, and local—is estimated at about $5.7 billion this year; the peak year of the program, say 1965, could bring highway construction to as high as $11 or $12 billion.

Road builders say they can expand to carry this new business. And they're confident equipment and materials makers will be able to meet the increased demand.

Business Outlook is Cloudy

Administration officials may worry about the general business outlook between now and election day. But they don't need to worry about construction. A top group of industrialists and businessmen —the Department of Commerce Business Advisory Council—agrees to this outlook.

The slide in housing starts is one thing that worries the economists. But they point out that this touch of softness is more than made up by the boom in other kinds of construction—industrial, commercial, and public works of all kinds.

The ceiling on expansion in construction, they agree, is the availability of materials—such things as cement and steel.

There's some fear that the tight money policy of the Federal Reserve Board could be enough to create a general business slide—turn such soft spots as autos and housing into a more general de-

cline. But businessmen and government officials alike publicly announce their confidence that the FRB would ease up on interest rates before any really significant dip could occur. An informal poll of industrialists taken by government officials disclosed that no one knew of a single instance in which a company failed to go ahead with new plant construction because of tight money.

Insurance Is Atomic Obstacle

Construction of civilian atomic power plants will speed up once Congress completes legislation on how to insure the plants against accidents that might endanger surrounding communities and citizens. The problem is expected to be settled by the time Congress adjourns in mid-summer.

Private developers are leery of going ahead with building A-power plants until the insurance problem is solved. And private underwriters are leery, too. They just don't know what kind of damage an atomic accident might cause. But the Congressional Joint Committee on Atomic Energy is going to recommend, and Congress is almost sure to vote, government assistance for insuring civilian plants. Once the legislation is voted—and it probably will insure indemnity over the limit private industry can provide—construction of plants across the country will begin.

Consolidated Edison Co. is ready to build a $55-million plant in New York.

Yankee Atomic Electric Co. has a license to build a $33.4-million plant in New England.

Detroit Edison Development Co. has AEC approval for a $45-million plant in the Great Lakes area.

Commonwealth Edison has approval of the Atomic Energy Commission to build a plant near Chicago. Estimated cost is $45 million.

A co-operative, Consumers Public Power District of Nebraska, is waiting to go ahead with a $24.3-million plant.

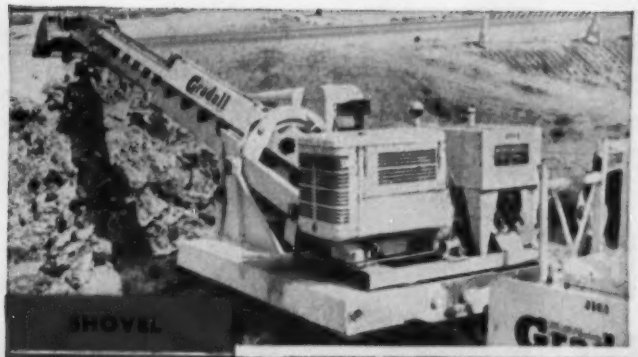
An Elk River, Minn., rural electrification co-op is awaiting AEC okay on a plant. Rural Electrification Administration has approved a loan.

Military Housing Becomes Important

Privately financed big military housing projects are booming under the new Federal housing laws and will continue for the next two years, at least.

Despite the over-all drop in housing starts—now running at an annual rate of about 1,110,000—some 200,000 new units at military bases are in prospect between now and 1958. In fact, the Defense Department hopes to have 100,000 under contract or commitment by Sept. 30 of this year.

Three multi-million dollar projects of the $3 billion program are already underway—a $12-million, 944-unit project at Abilene Air Force Base, Tex. A $3.5-million, 284-unit project and a $16-million, 1,216-unit project at Fort Bragg, N.C., and a $6.7-million, 500-unit project at Elgin Air Force Base, Fla.



SHOVEL

CRANE

LOADER

BACK-HOE

SPECIFY International® Engine POWER

...Sized and Modified for contractors' needs

When this Warner & Swasey Gradall's hydraulic power system signals the International power for more "horses," response is lightning-fast.

International's high torque lugging ability is only one of many standard-equipment built-ins that give this heavy-duty power decisive advantages on multi-purpose machines such as the Gradall.

In addition, *already-engineered* modifications of International engines are available in a wide choice of combinations to fit a tremendous range of construction equipment applications.

These modifications range from dimension changes of components or units, to a matching up of performance characteristics desired for special applications.

One typical International engine, for instance, with correctly-specified modifications, powers an International crawler tractor—and 46 makes of loaders, compressors, asphalt mixers, pavers, excavators, generators, pumps, graders, and compactors.

Contractors in Terre Haute or Timbuctoo know and respect International power. You too, will find it pays to specify International engines as original or replacement power—pays in job efficiency and simplified maintenance. Backing up International power is one of the world's most experienced heavy-duty engine parts and service organizations.

The Warner & Swasey Gradall does trenching, grading, excavating, ditching, stockpiling, lifting, loading and many other heavy-duty construction jobs. When there's an International engine generating hydraulic power for the versatile Gradall, you can be sure of ample pump pressure and rugged dependability job after job.

Choose from 18 heavy-duty International diesel and carbureted engines —from 17 to 214 hp.

See you at the CHICAGO ROAD SHOW Jan. 28 - Feb. 2, 1957

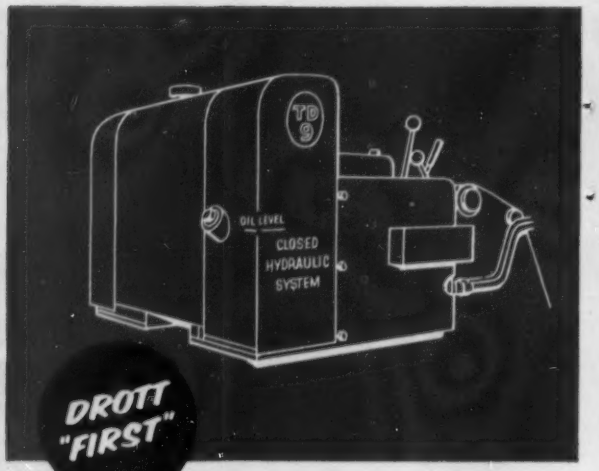
INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Company

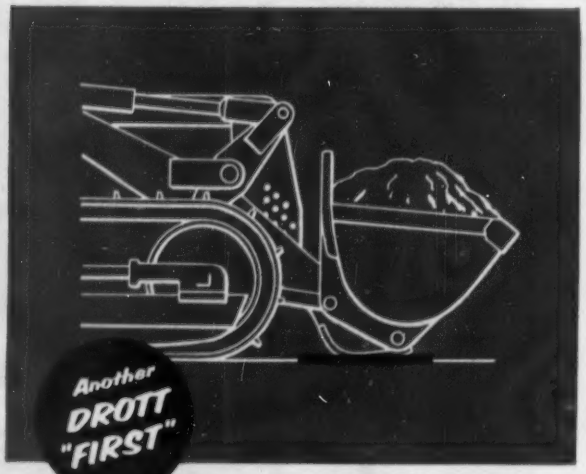
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps...Tractors and Rubber-Tired Loaders...Off Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks.

HOW YEARS-AHEAD INTERNATIONAL® DROTT® "FIRSTS" give you world-beating performance!

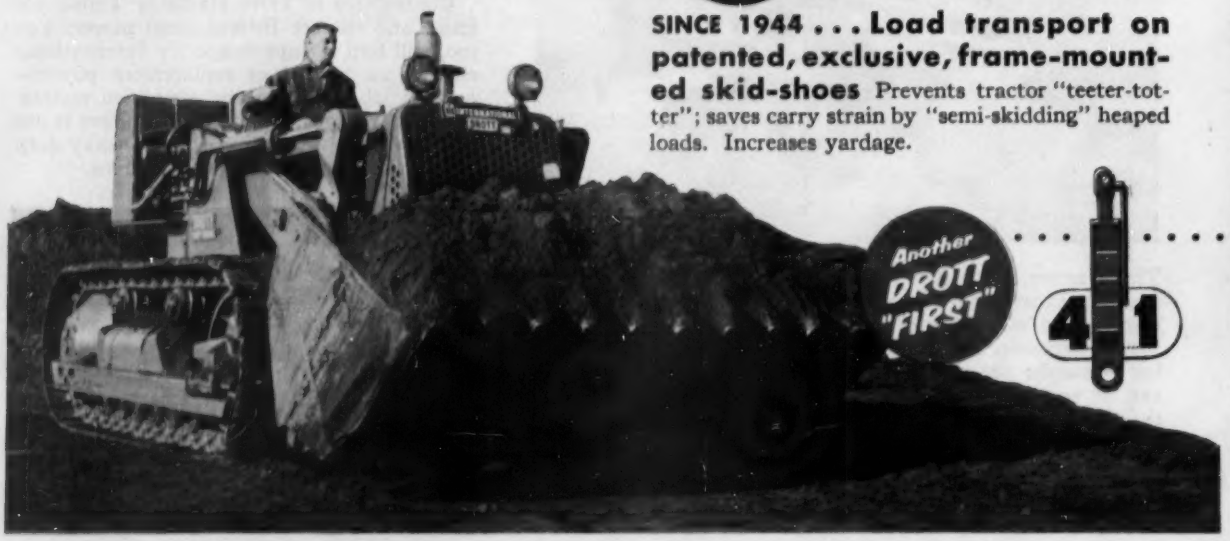
Major design features behind world-beating International Drott machine performance are not "flash" inspirations—not hastily-contrived imitations—not spur-of-the-moment attempts to "catch-up." Instead basic Drott features are "originals"—with years of patient and productive *field* and *engineering* experience in their conception and development. *By owning Drott equipment, you get the big profit-advantages of years-ahead design and performance—right now!* Look at the record! Compare the results!



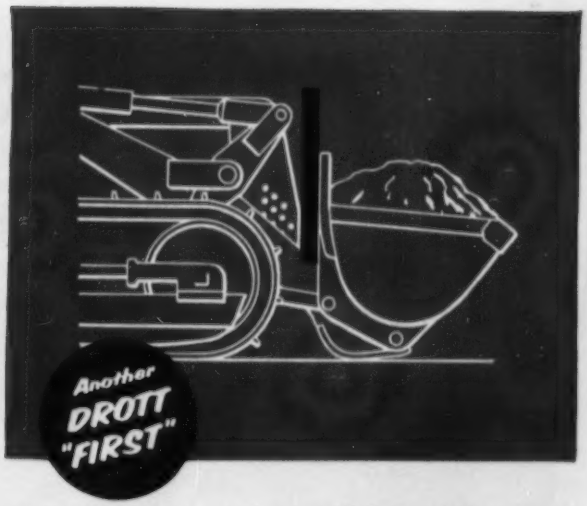
SINCE 1937... Closed hydraulic system Excludes abrasives and other foreign material—reduces wear and simplifies servicing. Keeps oil in; keeps air and dirt out.



SINCE 1944 . . . Load transport on patented, exclusive, frame-mounted skid-shoes Prevents tractor "teeter-totter"; saves carry strain by "semi-skidding" heaped loads. Increases yardage.

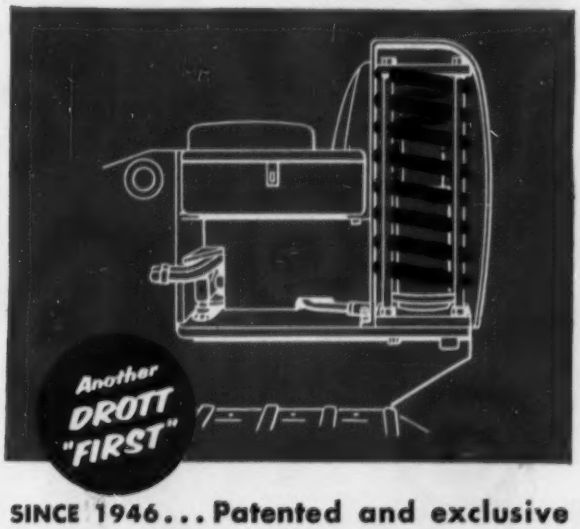


SINCE 1944 . . . Pry-action break-out Employs simple lever principle to give you *exclusive* triple-power digging force, ranging from 12,800 to 55,000 pounds! Shunts stresses into ground, so they can't maul bucket or tractor.



SINCE 1944 . . . Ground-level bucket roll-back Obtains heaped loads; *keeps the heap* to deliver extra yardage.

SINCE 1944 . . . Parallelogram raise action Keeps bucket at its 42° non-spill, roll-back level, all the way up. Increases yardage—avoids "spill-back."



SINCE 1946 . . . Patented and exclusive shock-swallowing hydro-spring Reduces effects of impact forces by 67%—to prolong equipment life, cut upkeep, reduce downtime, add operating comfort!

SINCE 1954 . . . Patented and exclusive DROTT Four-In-One Skid-Loader, bulldozer, Bullclam, clamshell, all in one—4-machine utility, one moderate investment. Now in 3 sizes, 1 yard to 2¼ yard capacity.

International Drott "firsts" like these combine to give you money-making performance and value *not available elsewhere*. You can prove it to your *satisfaction* and *profit*, by demonstration. See your nearby International Drott Distributor!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 8, Wis.

INTERNATIONAL®
DROTT®

Cut Your "Odd-Job" Costs with this Heavy-Duty Power!

It took only 1½ hours for R. Dykstra Septic Tank Co., Grand Rapids, Mich. to dig this 137-ft trench, 2-ft wide, 3-ft deep, with this International 300 Utility tractor equipped with back-hoe.

Sure-footed traction with the 39½ dhp 300 Utility speeds backfilling on the Dykstra trenching jobs!

With the new International® 300 UTILITY tractor,

you'll trench, backfill, load, 'doze faster, to step up manhour output on *all* your scattered odd jobs. This tractor leads its field with up to 1,000 pounds greater built-in weight for strength and stamina—it gives you more down-pressure on the trencher boom to fill the bucket full on every bite! With blade or loader for backfilling, its power and traction keep you going where wheels on lighter-weight outfits slip, and the tractor stalls.

The 300 Utility moves fast between jobs, too —up to 16.8 mph. It gives you *10 speeds forward*, including a dozing low-low of 1.8 mph, with optional Torque Amplifier to let you raise pull or push-power *without shifting gears!*

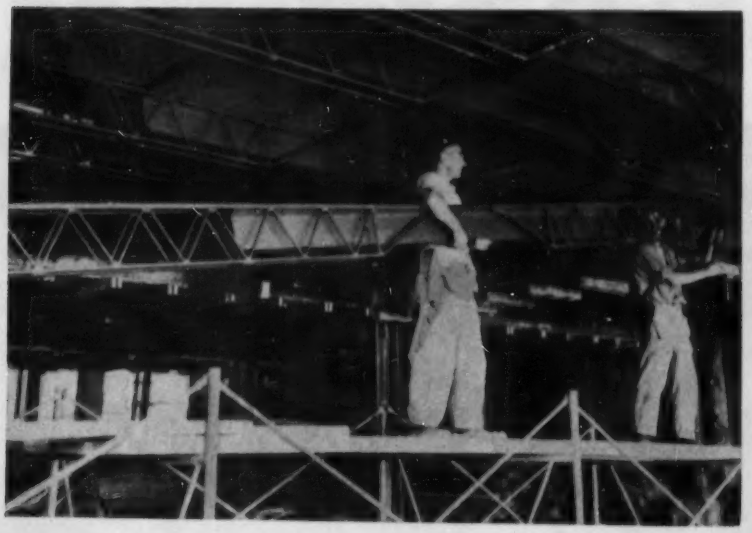
Your International Industrial Power distributor will demonstrate! Phone for a date. Or, write International Harvester Company, 180 N. Michigan Ave., Chicago, Ill., for free folder.

International Industrial Power

INTERNATIONAL HARVESTER COMPANY, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines

Job Talk . . .

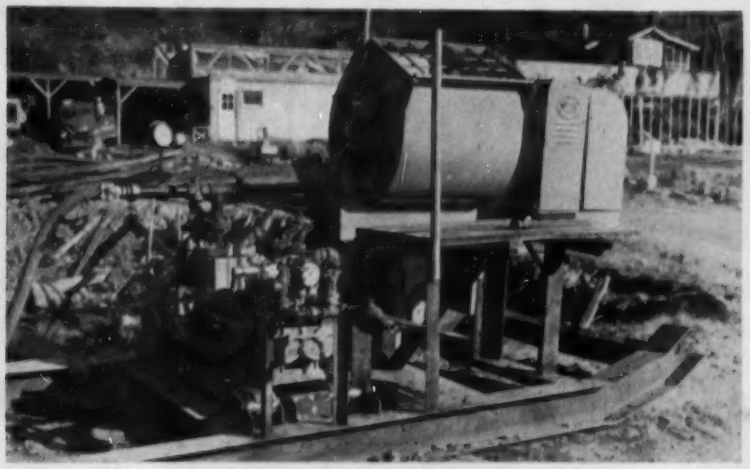


Telescopic Girders Sub for Shores

A lightweight lattice and web-plate girder that telescopes up to 29½ ft long eliminates vertical supports when pouring concrete floors.

Spanall has an adjustable camber and weighs only 8 lb per ft. Stripping is easy. Loosening a camber adjusting screw relieves stress, and allows the supports to be removed.

Lattice sections range in length from 4 ft 2 in. to 11 ft 8 in. Web-plate pieces vary from 6 ft 8 in. to 9 ft 11 in. All sections are interchangeable. Besides low cost, horizontal shores offer the additional advantage of clear work area.



Mobile Grout Pumping Rig

A skid-mounted grout-pumping unit is proving its worth for James McHugh Construction Corp. on a water supply project near Washington, D.C. A Muller mixer dumps 2-ft batches into a 6-ft hopper made by cutting down an old 55-gal drum. Sides were built up with plywood. The hopper permits continuous pumping while the mixer is preparing grout. Skids permit fast moving.

Walkie Talkie Sets Keep Tabs on Pour

Pouring an 825-yd slab 95 ft in the air at a big refinery job in Delaware required close coordina-

(Continued on page 20)

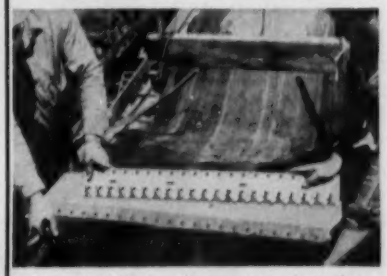
NEW

FLEXCO SPEED TOOLS

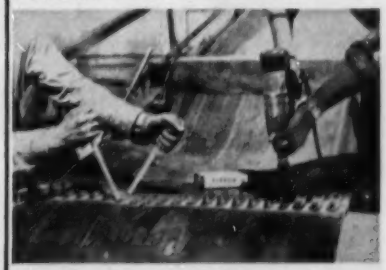
CUT APPLICATION TIME IN HALF

Your two man belt team can now join a belt 30" wide in 15 to 20 minutes . . . using the new FLEXCO Power Tools.

The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.



Running down nuts is fast with the new FLEXCO Speed Wrench used with electric or air impact tool. Two Bolt Breakers are used together to complete the joint.

If you are interested in speeding up fastener application, order the new Speed Tools from your local FLEXCO Distributor. Write for Bulletin F-112-A.

FLEXIBLE STEEL LACING CO.

4699 Lexington Street • Chicago 44, Illinois

World's best protection

TEXACO SIMPLIFIED LUBRICATION PLAN
Enables you to handle all major lubrication with no more than six Texaco Products. Your Texaco Lubrication Engineer will gladly show you how the Plan reduces lubricant inventory, saves time and money, and helps you avoid lubrication mistakes.

TUNE IN:
TEXACO STAR THEATER
starring
JIMMY DURANTE
on television . . .
Saturday nights, NBC.

TEXACO

against wear and rust

TEXACO MARFAK is the name. This famous chassis lubricant clings to metal and seals the working grease within the bearing. Heavy loads won't squeeze it out, rough roads won't jolt it out. Its persistent lubricating film fights wear and prevents rust. Parts last longer, maintenance costs come down.

For wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in —assuring safer braking and extra thousands of miles between repackings. No seasonal change required.

For those who want a multi-purpose lubricant, *Texaco Marfak Heavy Duty Special 2* is the new, lithium-base grease that can be used for chassis, wheel bearings, water pumps and other bearing lubrication.

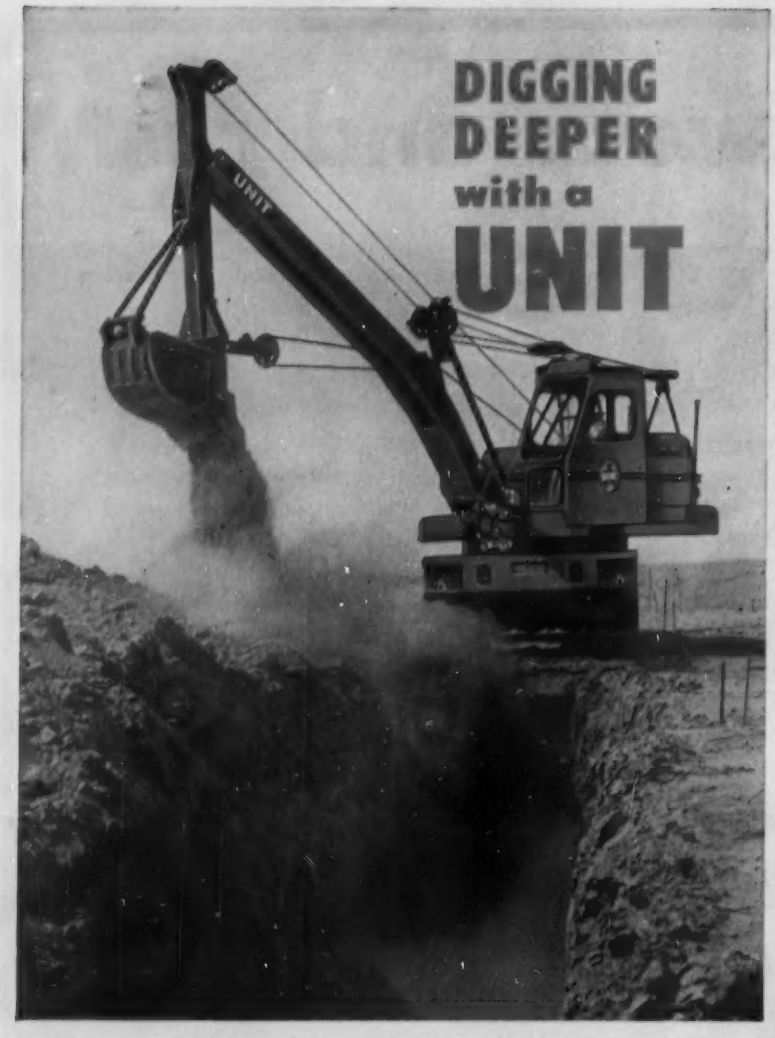
MORE THAN 625 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

For crawler mechanisms, use *Texaco Track Roll Lubricant*. It protects against wear and rust, prolongs roll life. For transmissions and differentials, use *Texaco Universal Gear Lubricant EP*—assure smoother performance, lower maintenance costs.

Let a Texaco Lubrication Engineer help you keep work on schedule through effective lubrication. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



You'll Dig More Jobs At More Profit With A UNIT TRENCHOE!

Accurate deep digging of trenches for pipelines, sewers, water connections, footings, basements and culverts is easily and quickly accomplished with a UNIT Trenchoe. The "Goose-neck" boom with its long deep reach assures maximum production. Also saves time trimming vertical sidewalls and corners, and in leveling floor surfaces. Powerful... Compact... Perfectly Balanced. Every UNIT is designed to meet the most rigid demands. Investigate today and earn more pay.

UNIT models are available in ½ or ¾ yard Excavators . . . Cranes up to 20 tons capacity . . . Crawler or Mobile types . . . Gasoline or Diesel. Ask for literature.

UNIT CRANE & SHOVEL CORPORATION
6305 W. Burnham St. • Milwaukee 14, Wis., U. S. A.

UNIT CRANE & SHOVEL CORP. UNIT MILWAUKEE, WISCONSIN

Geared to Produce Maximum Yardage

JOB TALK . . .
Continued from page 17

tion between ground and placing crews. (See story in this issue) Foremen kept in close contact with Motorola Handie-Talkie two-way radio sets, and the operation was completed in only 10 hr. Contractor is C. F. Braun & Co. of Alhambra, Calif.

New Device Lifts Non-Palletized Brick

A crane-operated rig can hoist pallet-free packages of 300 brick and land them directly on a scaffold at the mason's elbow. Brick-Lift is roughly 3 ft square, and weighs 350 lb. It is dropped over a pile of bricks, a release pin is removed, and the load is raised.

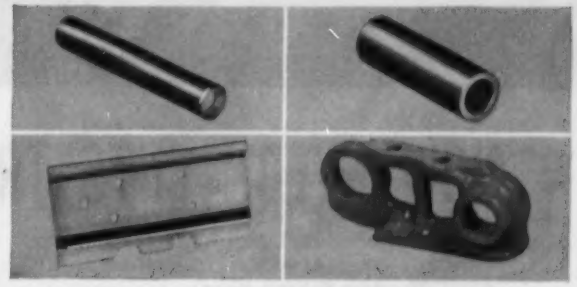
When it comes to parts, don't let "look-alike" substitutes get you off the track.

Genuine Caterpillar track shoes are made of only high-quality rolled steel, specially hardened by an exclusive process. Links are induction-hardened, pretested steel, and their design is the result of years of research and development. CAT* track pins and bushings are also specially hardened, with a deep case and a tough core. You're *sure* you're on the right track with Cat original parts.

With substitute parts, can you be sure of anything?

Better see your Caterpillar Dealer's Parts Representative — and get Cat original parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



Caterpillar track parts take the brunt of the punishment when the going is toughest. They are subjected to abrasive sand and gravel, brutal shock loads from stumps and rocks. Why take chances with substitutes?

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Nylon cord tires reduced off-the-road tire failures...

NOW NYLON CUTS TRUCK TIRE COSTS, TOO

FRED ALDRICH, Truck Supt. Sam Braen's Sons, Hawthorne, N. J., reports:

"Two years ago we started using nylon cord tires on our off-the-road equipment. They stood up under the roughest kind of quarry work, made tire failures rare.

"That convinced us nylon cord tires had something extra, so we put them on our trucks, too. It's paid off, because we get far fewer failures, more miles per dollar.

Forming an All-Nylon Fleet

"We're sold on nylon cords. Half of our 400 pieces of equipment are on nylon now, and we specify nylon cord tires for all replacements and new equipment."

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads—lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON for TIRE CORD

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

NOW . . . IN PASSENGER-CAR TIRES, TOO . . . THE STRENGTH OF NYLON . . .
FOR UTMOST SAFETY . . . SUREST PROTECTION AGAINST TIRE TROUBLE

A FULLY AIR-CONTROLLED 1¼-YD. MACHINE

THE NEW LORAIN-56

1¼-YD. SHOVEL

25-TON CRANE
(as fully convertible machine)

30-TON CRANE
(as heavy-duty lifting Crane on extra-wide crawlers)

ALL OF THESE FEATURES AND MANY MORE ARE STANDARD

2 LEVER "METERED" AIR OPERATION

Easier! Faster! Simpler! Uses only 2 levers to apply "Air-Ease" power to all turntable operations. A new concept in fingertip control. Retains full "feel" of machine.

"SHEAR BALL" MOUNTING

No centerpin or nut, no rollers to wear. No adjustments! Provides smooth, rock-steady, "ball bearing" swing. Nothing else like it on any other make of shovel-crane.

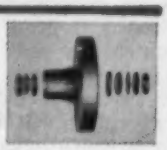
SQUARE-TUBULAR-CHORD CRANE BOOM

Lighter! Longer! Stronger! New, patent-applied-for design gives greater strength, less weight. Permits increased lifting capacities and working with longer booms.

TORQUE CONVERTER

Gives the smoothest, most productive power take-off that can be had. Multiplies engine torque. Effectively absorbs digging shocks and strains. No-stall, "never-say-die" power hangs on—maximum work obtained from the diesel engine.

ANTI-FRICTION BEARINGS



Now, anti-friction bearings on hoist and swing drums and travel shaft provide the ultimate in performance . . . smoother, more efficient.

AIR CONTROL OF CRAWLER

Now — air does the work, controls travel, steering, tread lock, swing-travel jaw clutches. Far greater ease of operation. Adds greatly to production.

REMOVABLE COUNTERWEIGHT

New design makes it possible to detach counterweight easily for lower weight when transporting this new Lorain over the highway. Can be removed or installed in minutes.

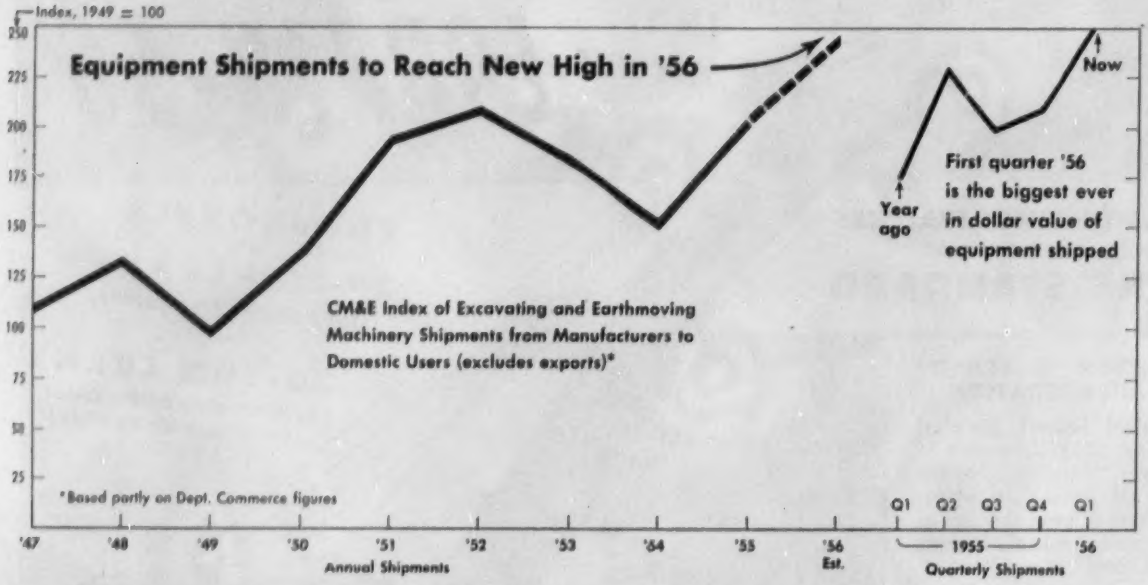
Here's the newest 1¼-yd. shovel-crane, the Lorain-56—and it has *all* the newest, most advanced features combined into one machine. 2-lever, metered air controls... "Shear Ball" mounting... torque converter... and many, many other *standard* features are included. Operators will like its simple, easy operation and freedom from adjustments. Owners will find the resulting higher production profitable. A few of these outstanding features are briefly described at the left. Get the *full* Lorain-56 story from your Thew-Lorain Distributor now!

THE THEW SHOVEL CO., LORAIN, OHIO

ASK YOUR THEW-LORAIN DISTRIBUTOR FOR FULL DETAILS ON THIS NEW MACHINE

THE NEW LORAIN

It's Your Business . . .



Contractors Load Up On New Equipment

NEW excavating and earthmoving equipment is rolling out from manufacturers to construction contractors in record volume this year. In fact, the dollar value of rigs shipped during the first quarter was more than in any other quarter in history. CM&E's new Index of Equipment Shipments to domestic users (excludes exports), shot up to 248 in the first quarter. This is 40% above the first three months' shipments in 1955.

This year, equipment shipments will set a new mark in dollar value. CM&E's index figures to rise to a new all-time high of 240 for the year 20% above the 204 in 1955 and topping the previous record of 210 in 1952. This estimate is based on our forecast of this year's construction contract awards which will top $20 billion, plus higher equipment prices this year.

Because of the terrific demand for new equipment, equipment makers have huge backlogs of orders which they're working off as fast as they can. Some contractors anticipated the slowdown in deliveries resulting from the logjam in new orders. To protect themselves they have ordered their needs further in advance. This is one reason why Morrison-Knudsen, for instance, jumped its construction machinery purchases to $11 million last year, more than double the rate of its buying during the preceding five years.

Now that the big highway program appears to be headed safely through Congress and with construction contracts setting records in nearly all types of work, pressure will continue for more new equipment. Deliveries will probably not improve much this year, especially for large shovels, cranes, tractors, and rubber-tired scrapers.

The auto industry is cutting back its take of steel output which frees more for construction equipment makers. But there's still the threat of a steel strike at mid-year. A long strike would complicate the delivery picture for construction equipment later this year.

Equipment Prices Up 7.8%

Construction machinery prices are now 7.8% higher than a year ago, according to the BLS index of manufacturers' prices. Tractor prices have led the rise with a thumping 10% increase, including a 1.5% rise between March and April of this year.

Other price increases in the last 12 months average: 8% for power cranes and shovels; 6% for machinery mounted on tractors; 6% for scrapers and graders; 9% for hand-held air tools; 5.3% for mixers and pavers; and 1% for portable air compressors.

A sharp rise in steel prices at mid-year could result in further increases in equipment prices. This is one more reason why contractors may find it wise to order their equipment as far in advance as possible.

Materials Outlook Spotty

During the coming months of peak construction activity, contractors can expect shortages and slow deliveries on structural steel, cement, and glass. The poor spring weather in many sections of the country resulted in a pent-up demand, but now the scramble is on for materials. Even though suppliers have built up inventories, they expect them to disappear fast in many areas.

For example, serious cement shortages are expected during the next three months in these areas: Baltimore, Birmingham, Boston, Cincinnati, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, and New York. In addition, Detroit expects cement to be tight;

(Continued on page 28)

D9 MOVES BIG YARDAGE

for MORRISON-KNUDSEN

A CAT* D9 Tractor with No. 9S Bulldozer is the prime earthmoving tool on this Morrison-Knudsen contract in Idaho. The job—relocating 11.37 miles of the Idaho City-Owl Creek road—involves clearing 64 acres and moving 337,000 cubic yards of dirt and rock. One rock cut is 87 feet deep and there are fills up to 30 feet.

With its huge 14-foot 'dozer, capable of handling up to 9 cu. yd. at a blade load, the D9 makes 40 passes, 200 feet long, per hour.

Now that the D9 has proved itself on jobs all over the country, owners recognize it as the top production machine among big tractors. It's the first track-type tractor with Turbocharger. The 286 HP Caterpillar Diesel Engine gives it ample power to match its weight and traction. You have a choice of torque converter or oil clutch drive. And there is "Live-shaft" drive for rear-mounted equipment.

Operators say this big machine is "as easy to handle as a small tractor." Easy to service, too. The exclusive, trouble-free oil clutch, separately removable power train components and a fuel system that needs no adjustments in the field are among the reasons why.

Your Caterpillar Dealer can give you some eye-opening facts about the economy of the D9 for big yardage jobs. Ask him for a working demonstration today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Clifty Creek Power Plant
on the Ohio River,
Madison, Indiana

FINISHED 2 MONTHS AHEAD OF SCHEDULE!

Congratulations to Ohio Valley Electric Corporation and to Every Worker Who Helped Speed These Projects to Completion! Built to supply power for the Atomic Energy Commission's gigantic uranium diffusion plant near Portsmouth, Ohio, these plants are of vital importance in America's defense program.

MORETRENCH CORPORATION

90 West St.
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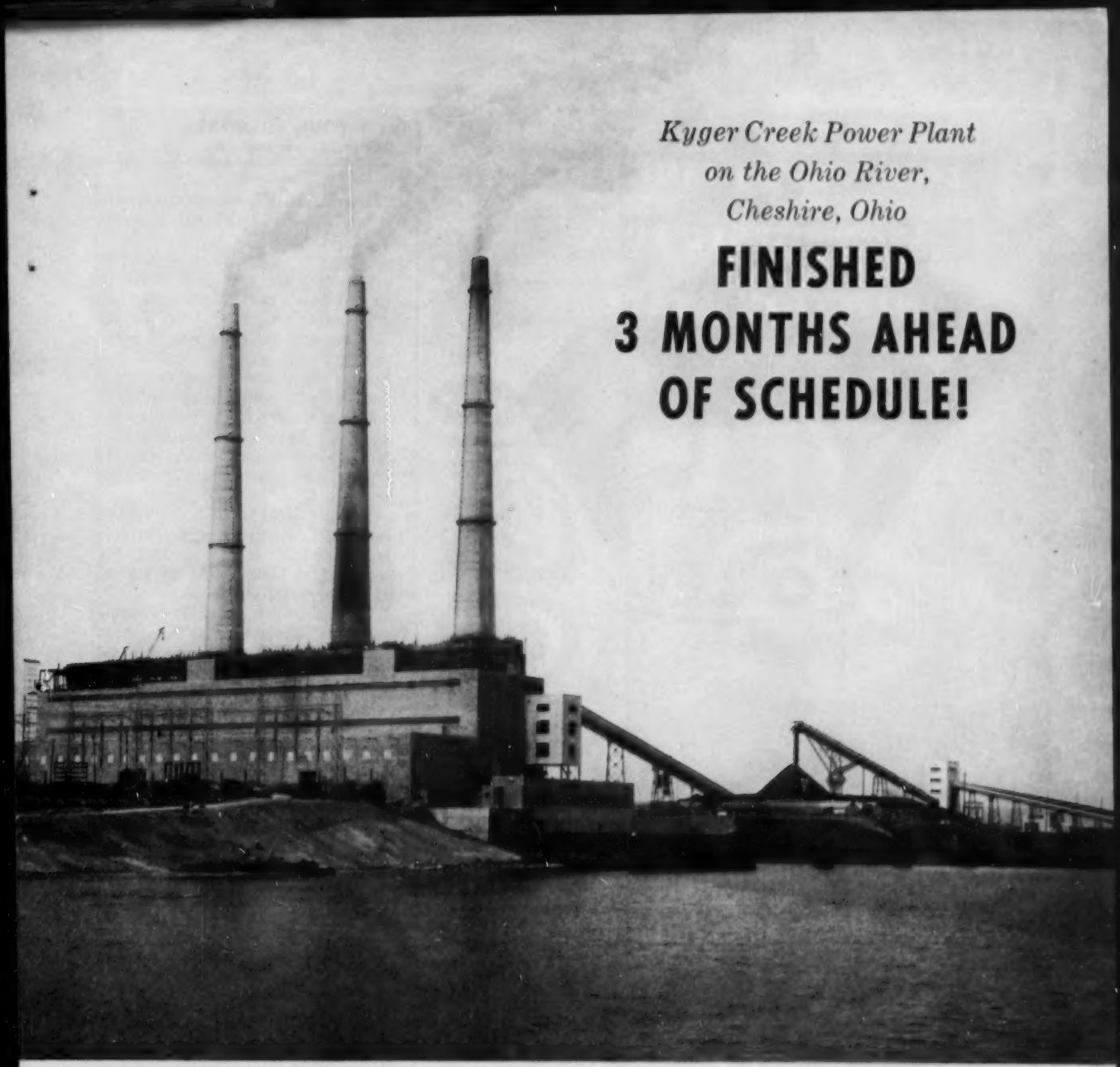
4900 S. Austin Ave.
Chicago 38, Illinois



Kyger Creek Power Plant
on the Ohio River,
Cheshire, Ohio

FINISHED 3 MONTHS AHEAD OF SCHEDULE!

DEEP FOUNDATIONS FOR BOTH PLANTS WERE DUG

IN THE DRY

with MORETRENCH WELLPOINT SYSTEMS

Engineering, Design, Construction: AMERICAN GAS AND ELECTRIC SERVICE CORPORATION, New York

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LOW COST INSURANCE
FOR DIESEL FUEL
INJECTION SYSTEMS

with AMERICAN BOSCH "FSA"
final stage fuel oil filter

Give your Diesel fuel injection equipment positive protection against damage caused by minute dust and abrasive particles. Install an American Bosch "FSA" Final Stage Fuel Oil Filter. It costs just a few dollars, yet contains an improved water-resistant filtering material that traps all particles that get through primary and secondary filters. The sealed construction is tamperproof . . . installation on any Diesel is quick, easy, inexpensive.

You'll find that the American Bosch "FSA" Filter will pay for itself many times over by lowering maintenance and overhaul costs. For the full story, contact your nearest American Bosch fuel injection agency or write to American Bosch, Springfield 7, Massachusetts.

3931

AMERICAN BOSCH
Division of
American Bosch Arma Corporation

IT'S YOUR BUSINESS . . .
Continued from page 30

Chicago sees possible spotty shortages; and New Orleans supplies may get tight.

Not only will cement be hard to get, but prices are headed up. In Philadelphia, cement may jump 25 to 40 cents per barrel, and Kansas City expects prices to rise 20 cents for the third quarter. Detroit and Boston anticipate an increase of a few cents. There's no indication of what the mills will do, but they are granting wage increases, and that means they'll be passing on the higher production costs in higher prices.

Though steel mills are shipping far more structurals and reinforcing bars this year than last, the tremendous demand is eating up available supplies fast.

Structural steel will continue critically short during the next three months, and the price is going up, probably in July. Some see mill prices rising as much as $12 per ton, and others in the industry see an advance well above last year's substantial rise of $7 per ton.

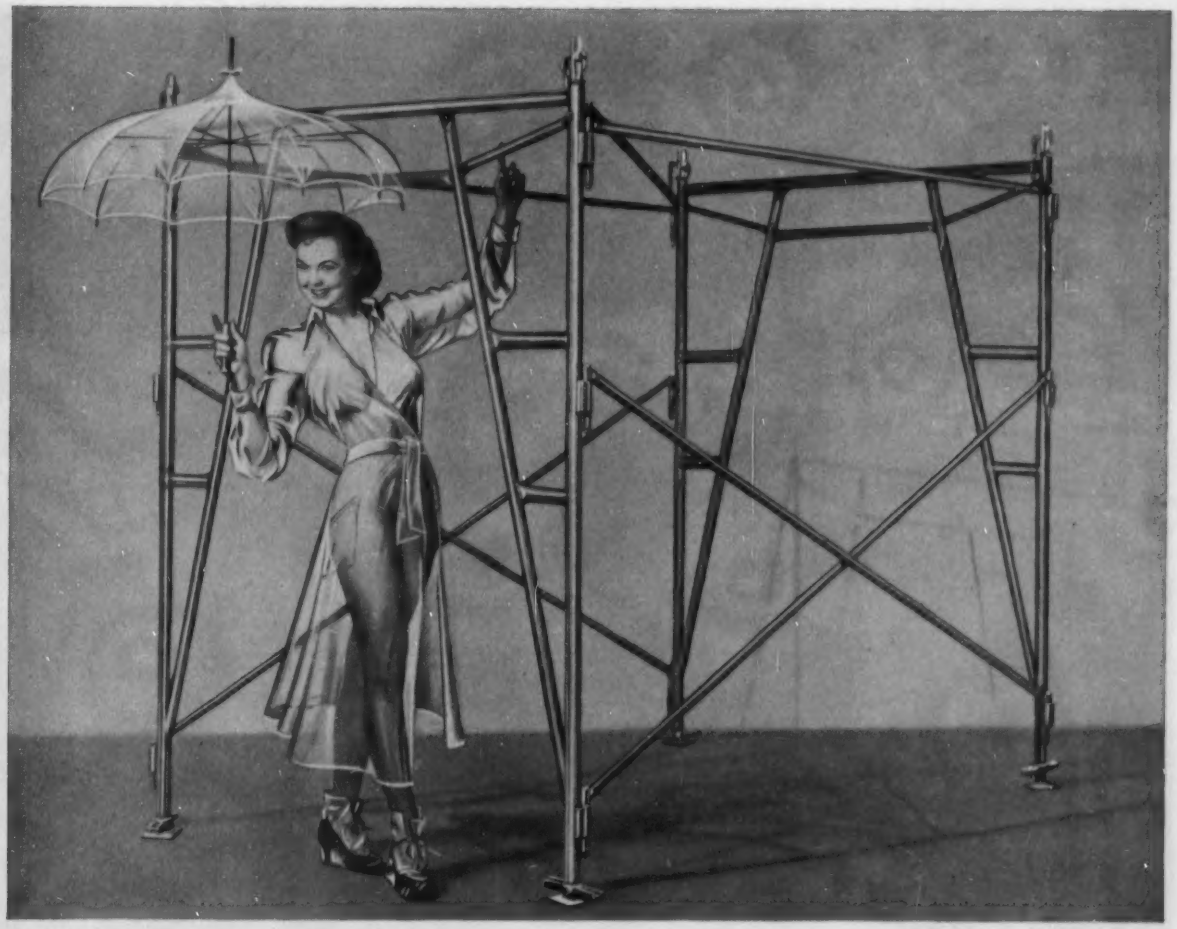
Proposed Backlog To Hit $100 Billion

The longer this construction boom goes on, the longer it looks like it will last. While contractors have been signing up a record volume of awards—up 22% so far in 1956—other work has been entering the planning stage in even greater volume.

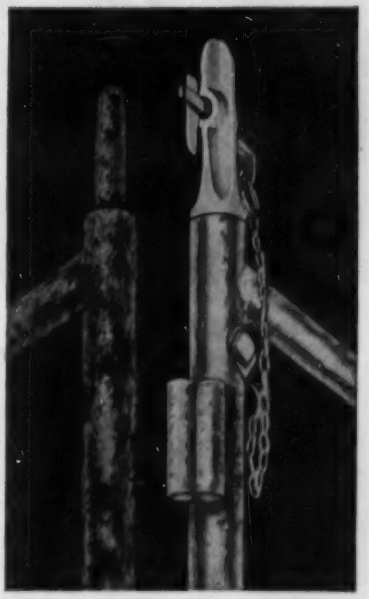
During the four months, January to April, construction projects estimated to cost $10 billion were proposed. This record amount of jobs going into the planning stage pushed the total Heavy Construction Backlog of proposed work to $98.6 billion as of April 30. And plans continue to pile up fast so that by June the total backlog is a sure bet to top the $100-billion mark for the first time in history. That's about five years work at the current high rate of awards.

The backlog has grown during the last 12 months in all regions. While the U. S. total is 17% above last year, the Far West's backlog has risen by 38%. In the Middle West, it's up 21%, and in the South it is 19% higher. The West of the Mississippi has a 10% rise. Backlogs also are climbing, though at slower rates, in the Middle Atlantic, 8.5%, and New England, 6.5%.

(Continued on page 239)



You have a 'skin protection' problem in your scaffolding, too!



A raincoat or umbrella won't protect your scaffolding—but now there is a foolproof answer for you to keep scaffold surfaces lastingly smooth. Insist on the only available "skin protected" scaffolding—Universal Galvanized.

Through this new galvanized coating, Universal has made it possible for you to forget all about profits and time lost by your men if they must work with corroded, rusted scaffolding. Now every part of this top-quality scaffolding is covered with a smooth, lubricative coating which permits maximum "workability" in minimum erection time with no costly maintenance—*and at not one cent of extra cost.*

This exclusive feature, plus the ease of assembly afforded by Universal's exclusive Gravity-Lock mechanism, is your assurance that when you buy or rent Universal Galvanized, you are using the *ultimate* in steel scaffolding available today.

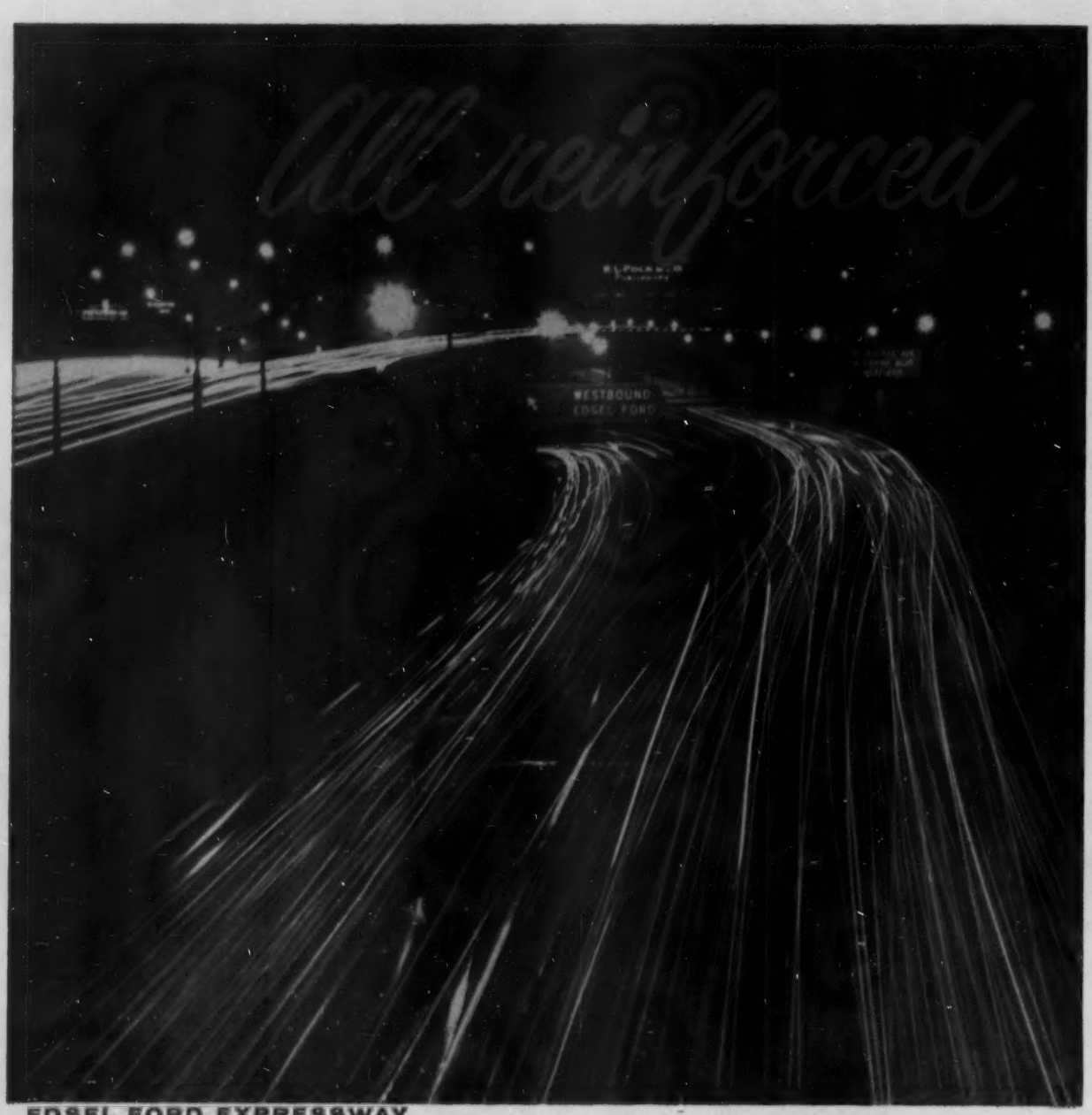
Write for our catalog describing the available sizes and types of panels for all types of construction, mason, or maintenance applications.

"American Tubular" Elevators now galvanized also—Write for catalog.

the only

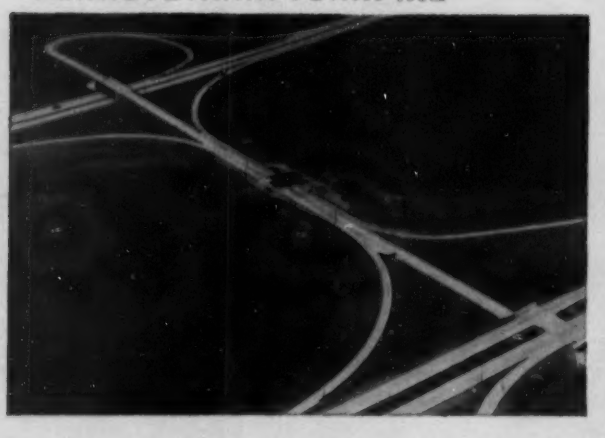
UNIVERSAL GALVANIZED SCAFFOLD

UNIVERSAL MANUFACTURING CORP. • ZELIENOPLE 6, PA.



EDSEL FORD EXPRESSWAY
JOHN LODGE EXPRESSWAY

PENNSYLVANIA TURNPIKE



with AMERICAN WELDED WIRE FABRIC

EASY TO INSTALL. American Welded Wire Fabric comes in prefabricated sheets that can be placed quickly with minimum crews. It stays in place during pouring.

LOW COST. American Welded Wire Fabric has high-strength steel wire, electrically welded together for positive anchorage. The concrete slab is effectively reinforced with less steel than other types of reinforcement; so you have less steel to buy and less to handle. American Welded Wire Fabric keeps down maintenance costs, too, because it prevents destructive cracking, keeps roads smooth and safe.

VERSATILE. American Welded Wire Fabric comes in wide sheets for continuously reinforced concrete pavements in wire sizes up to and including ½" in diameter, at 2", 3", 4", and 6" on centers. The use of American Welded Wire Fabric increases the strength of the concrete slab by 30% over that of non-reinforced concrete.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL
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COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
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Every type of reinforced concrete construction needs

USS American Welded Wire Fabric

UNITED STATES STEEL USS

OHIO TURNPIKE

American Steel & Wire
Room B-66, Rockefeller Bldg.
Cleveland 13, Ohio

Please send complete information on the following products:

- ☐ American Welded Wire Fabric for Portland Cement Concrete
- ☐ American Welded Wire Fabric for Asphaltic Concrete
- ☐ American Welded Wire Fabric for Airport Runways
- ☐ American Road Joints
- ☐ Multisafty Highway Cable Guard
- ☐ American Beam-type Highway Guard
- ☐ American Wire and Strand for Prestressed Concrete

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WITH YOUR GALION AND A B&L ELEVATING GRADER ATTACHMENT

With this combination, ONE MAN can keep a fleet of trucks working all day long, or cast more dirt than any other group of machines — and with less manpower requirements and cost of operation.

A heavy-duty power take-off is connected direct to the engine crankshaft of grader through V-belt drive and disc clutch controlled from grader cab. This control is furnished with the attachment. All other operations utilize the standard hydraulic controls on your GALION Grader. The standard 16-ft. carrier is easily extended by inserting one or two 3-ft. sections. This attachment is easily removed to convert grader for normal operation.

For more-than-ever profitable use from your GALION Grader, add the multi-purpose B & L Elevating Grader Attachment. Write for literature.

OTHER GALION GRADER ATTACHMENTS

HYDRAULIC SCARIFIER

V-type with eleven teeth mounted in a heavy box-type block of welded construction. Teeth are made of tough steel and have renewable heat-treated points. A valuable attachment for tearing up old pavements or reworking old gravel road surfaces to remove chuck holes, ruts, etc.

Other Galion attachments include Creeper Transmission · Hydraulic Shiftable Moldboard · Snow Plow and Wing · Bulldozer · Right or Left 2-ft. Moldboard Extensions · Enclosed Cab · Write for literature.

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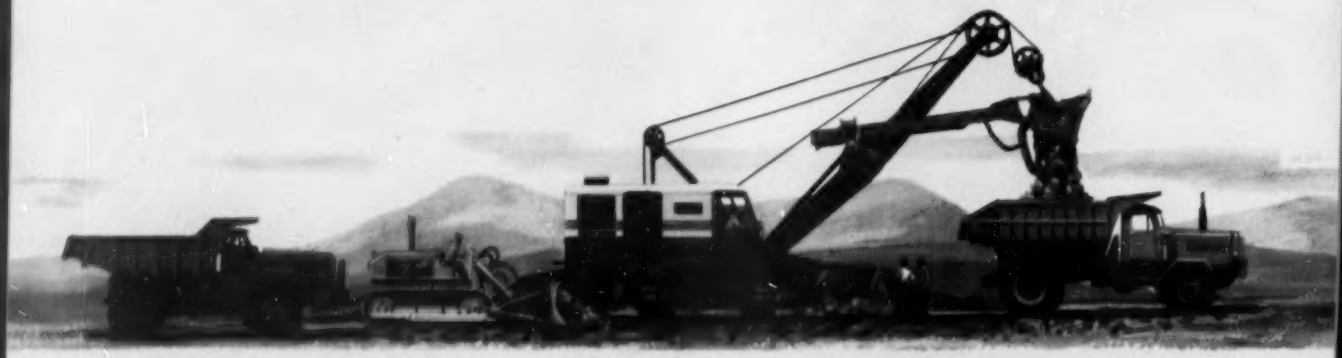
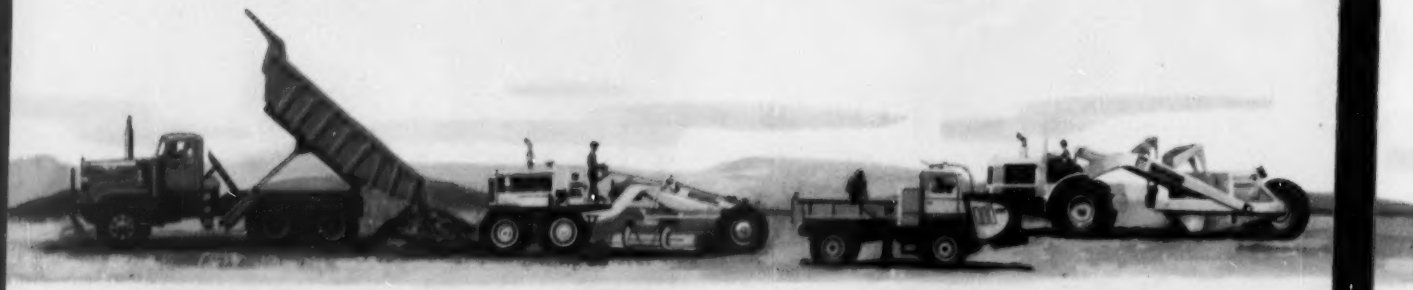
how to make more profit in all kinds of construction work!

Standardize on Cummins Diesels

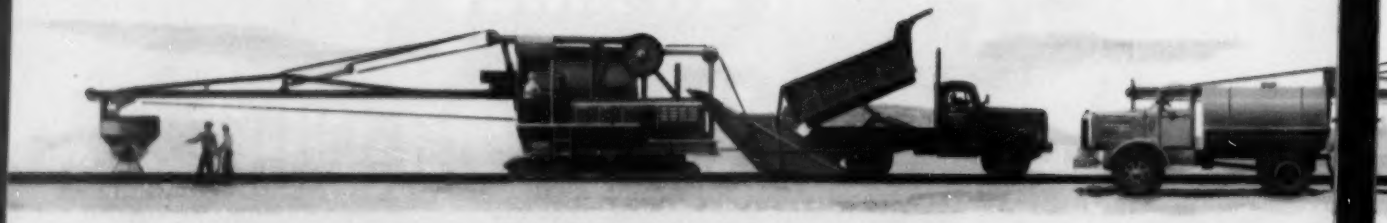
for more profit in road building.



OSHKOSH EIMCO BUCYRUS-ERIE DART



MACK off-highway ADAMS WALTER WOOLDRIDGE

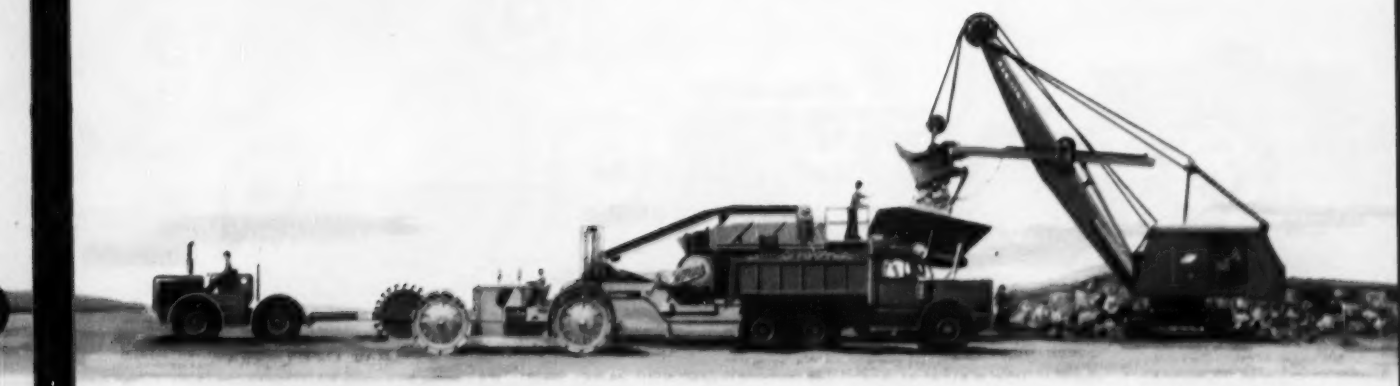


WORTHINGTON WHITE FOUR WHEEL DRI

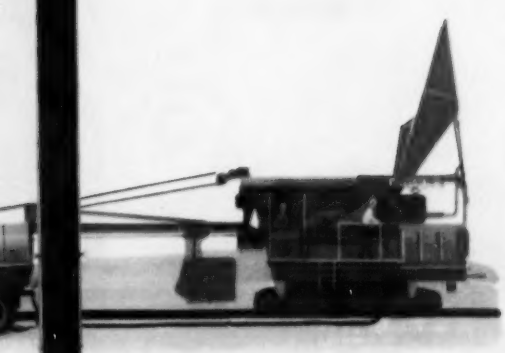
In every phase of highway construction, from the first earth-moving . . . through base work . . . to the paved finish, there's more profit for you when you standardize on Cummins Diesels. Cummins rugged, high horsepower design and Cummins advanced diesel features assure you of top performance and top equipment availability . . . top profit from all of your machines.

The 56 pieces of equipment shown on this and the following pages use Cummins Diesels as standard or optional power. Complete details on other models (over 40 leading manufacturers of construction equipment offer Cummins Diesels in 240 models) are available at your nearest equipment dealer or Cummins distributor.

LE TOURNEAU-WESTINGHOUSE EUCLID INTERNATIONAL



WAGNER BUFFALO-SPRINGFIELD CEDARAPIDS AUTOCAR MANITOWOC



KOEHRING

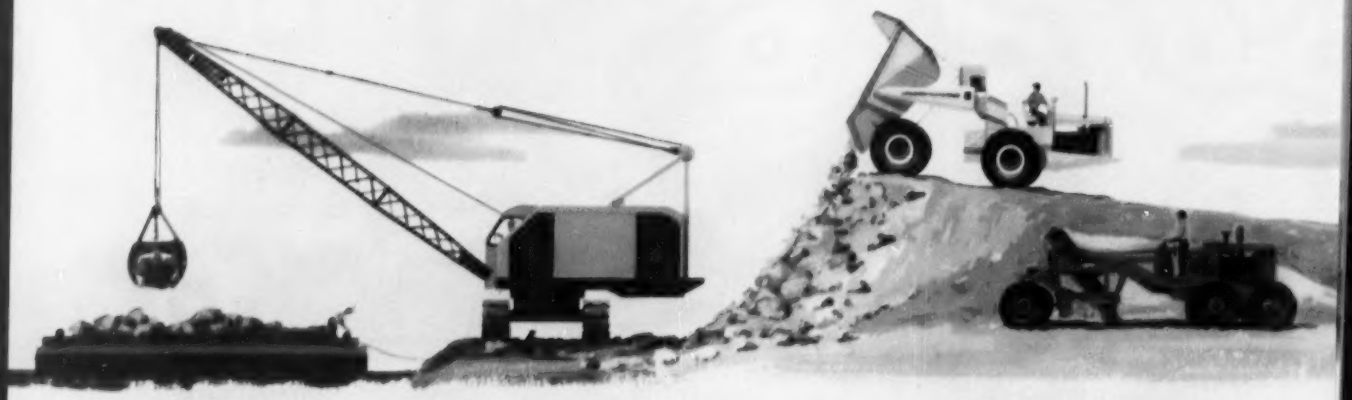
on any construction job

CUMMINS **MORE PROFIT**

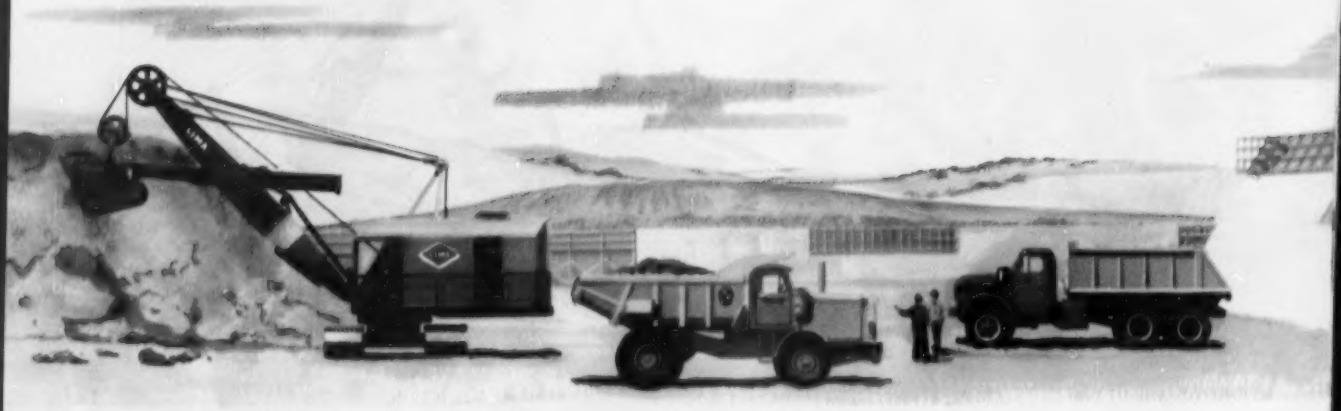
gives you the big plus

Standardize on Cummins Diesels

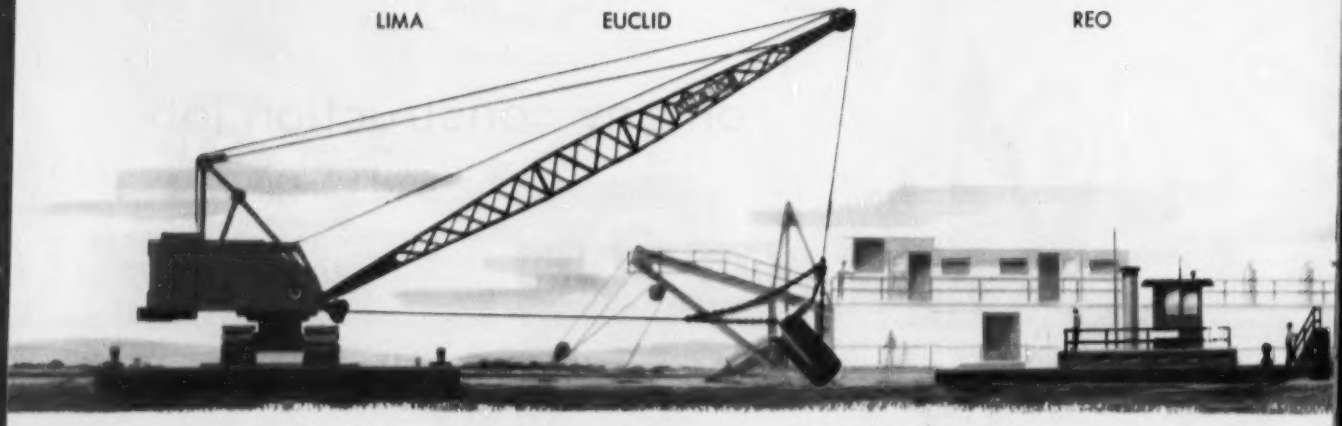
for more profit on dams and waterways



AMERICAN LE TOURNEAU-WESTINGHOUSE GALION



LIMA EUCLID REO



LINK-BELT SPEEDER CUMMINS powered workboat and dredge

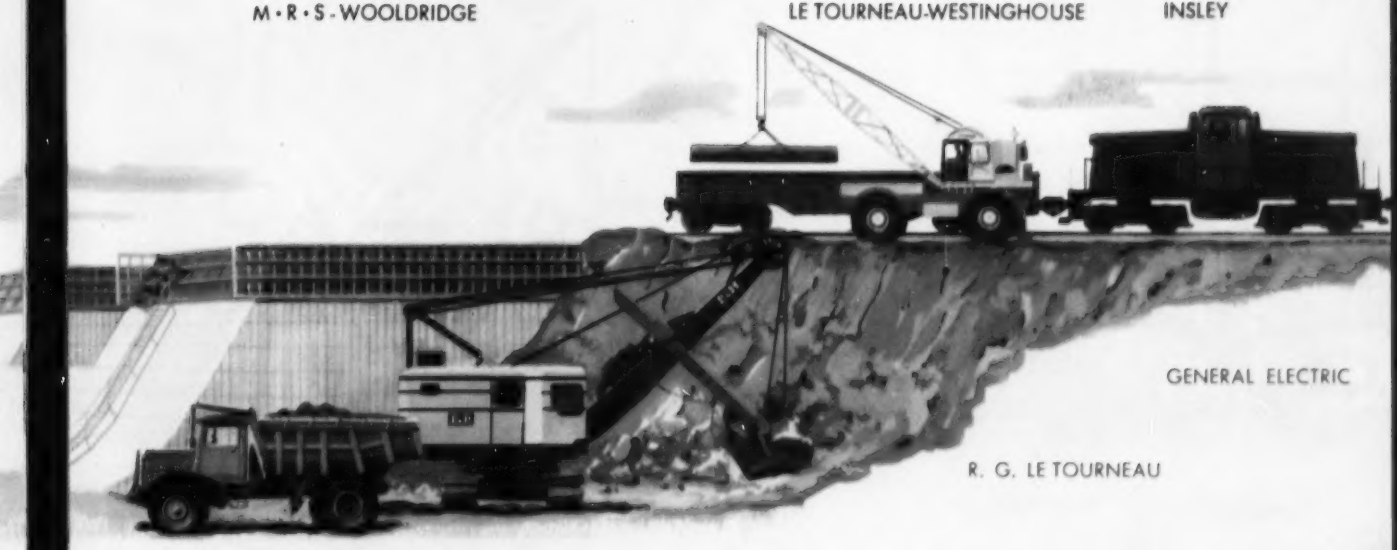
Today, you can get a Cummins Diesel for every type of equipment you're likely to use in building a levee . . . dam . . . or waterway. From the lightest to the heaviest work, Cummins Diesels make your job more profitable.

On jobs when a downtime hour can mean thousands of dollars lost, more and more contractors are finding they can count on Cummins for dependable day-in, day-out operation with minimum downtime . . . maximum trouble-free performance.

M • R • S - WOOLDRIDGE

LE TOURNEAU-WESTINGHOUSE

INSLEY

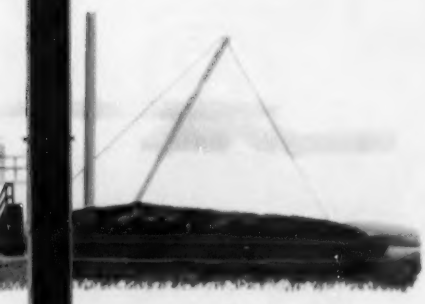


GENERAL ELECTRIC

R. G. LE TOURNEAU

KENWORTH

P&H



on any construction job

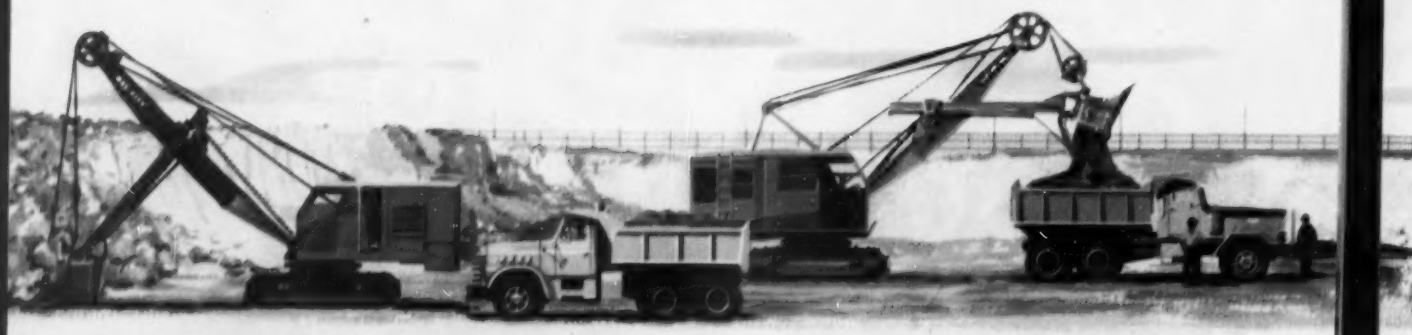
CUMMINS

gives you the ***big plus***

MORE PROFIT

Standardize on Cummins Diesels

for more profit in general construction



BAY CITY DIAMOND T KOEHRING HAYES

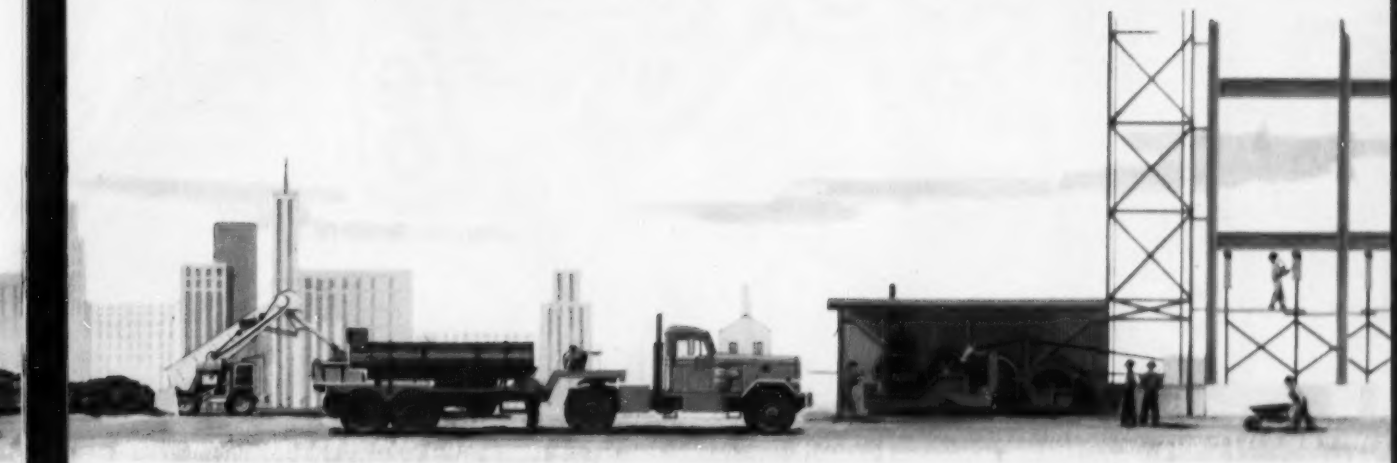
DOMINION INTERNATIONAL INDUSTRIAL BROWNHOIST

CUMMINS generator set EIMCO PACIFIC WORTHINGTON

It's also true that you now can have a Cummins Diesel for every phase of excavation work, building construction, and tunnel work. Here's the rugged, dependable power construction men can rely on . . . from the first bite of a shovel to the completed skyscraper.

Cummins Diesels deliver the most where the work is the roughest. The proven performance, dependability and economy of Cummins Diesels completes your job faster and more profitably.

MARION CUMMINS powered pump DART LIMA COOK



PETTIBONE-HAISS PETERBILT AMERICAN

on any construction job

CUMMINS

MORE PROFIT

gives you the big plus

Industrial Locomotives by —
BALDWIN-LIMA-HAMILTON,
PLYMOUTH, VULCAN

HERE'S WHY CUMMINS DIESELS DELIVER MORE PROFIT

Twenty-four basic Cummins engines: Over 150 models let you match power to every individual job. You avoid the excessive maintenance and fuel costs which result from underpowering . . the excessive initial cost of overpowering.

Full power range of Turbodiesels: The Cummins line now includes five new *TURBODIESELS*—175 to 600 h.p.—that deliver big power in a lightweight, compact package. The unique feature of these new *TURBODIESELS* is Cummins Turbocharging. Exhaust gas energy—normally wasted—supercharges the engines without adding any mechanical parasitic load!

Greater power availability: Cummins Diesels have the newest and finest dirt-protection features in the industry. Cummins basic engine design has the proven superiority of 4-cycle operation. Durable, high-strength metals and alloys such as Stellite valve faces and valve seats and camground pistons, cut scheduled repairs and unscheduled downtime to a minimum.

Simplest fuel system: Cummins exclusive PT fuel system meters fuel simply and accurately . . . needs no constant adjusting. It eliminates fuel racks, check valves, injection valves . . . and is the simplest diesel fuel system available today. It is far easier to understand and service than any other diesel or gasoline fuel system and is standard equipment on all models.

Reduced parts inventories: Bearings, pistons and many other parts are interchangeable on many Cummins models. This standardization reduces overhead in parts stock . . . assures time and space savings . . . lowers maintenance costs. All components are made to exacting engineering standards under strict quality control to guarantee uniformity—lower your over-all maintenance costs.

Expert service help when you need it: Cummins worldwide distributor organization—the largest devoted exclusively to the sale and service of diesel engines—makes service and parts readily available at nearly 200 maintenance points in the United States and Canada (and in over 100 export locations, too). Job-site availability of parts and service is also offered by Cummins Distributors.

Get more information on the manufacturers who offer Cummins Diesel power! Mail the coupon at the bottom of this page.

Cummins Engine Company, Inc.

Columbus, Indiana

MAIL THIS COUPON TODAY TO ABOVE ADDRESS

I am interested in finding out more about the advantages of Cummins Diesels.

_____ Send me, free of charge, a copy of "Cummins Who's Who"—a complete directory of equipment manufacturers offering Cummins Diesels in their machines.

_____ Send me, free of charge, the booklet, "Answers to Questions about Diesels"—an easy-to-understand explanation of how diesel engines operate.

_____ Have a Cummins representative call on me concerning my equipment requirements.

CUMMINS gives you the big plus MORE PROFIT

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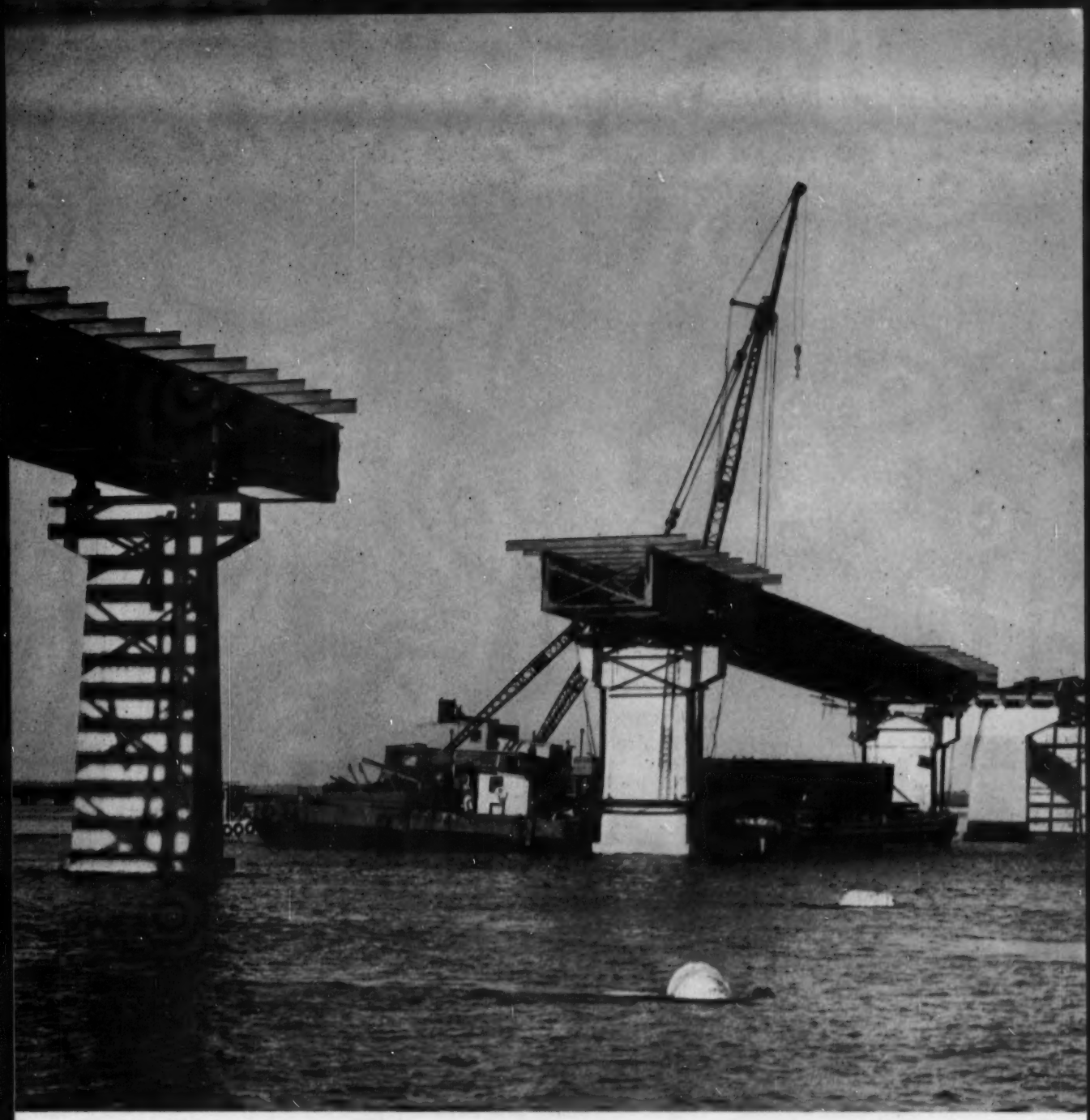


Wire Rope at Work—New Jersey's great Garden State Parkway has the incredible total of 282 bridges, and the photograph above shows the last of them nearing completion. It is the Great Egg Harbor Bay Bridge, an impressive span just west of Ocean City. The steelwork, more than a half-mile long, weighs some 2500 tons.

The picture was taken just after two 63-ton girders, completing a 180-ft span, had been erected. The derrick that did the hoisting was equipped with a 90-ft boom, a 43-ft mast, and Bethlehem Purple Strand wire rope. As always in lifts of this nature, a great responsibility rested upon the rope, but the sinewy Purple Strand was more than equal to the job. Taking the loads in stride, it made the dramatic lifts seem routine.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

(Advertisement)

Photo field-report on Michigan® Tractor Shovels:

Here are some of the jobs you can do with a Michigan

Strips asphalt Deleo Brothers, Stamford, Conn. contractor, uses this 1⅜-yd Michigan to break up and load asphalt paving which was undermined in a recent flood. Low-level bucket action and powerful breakout force get full loads of material in low repose.

Breaks out curbs

One-yard Michigan Model 75A breaks out and loads concrete curbing on Highway 51 . . . owner Lawrence Gerke, Merrill, Wisconsin.

Backfills sewer trench

Fay Improvement Co., San Francisco, backfills and rough-grades sewer trenches with this 1-yd Michigan. Power-shifting is standard on *all* Michigans.

Excavates fire pit

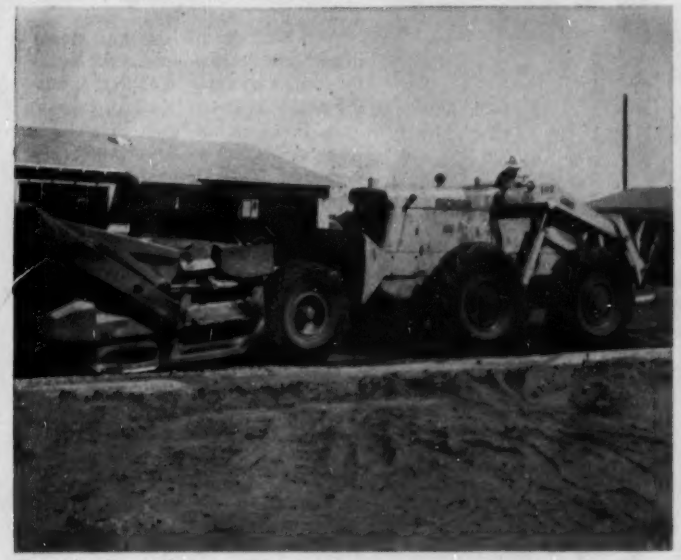
Michigan 175A removes debris from fire pit at Sproul Lumber Co., Perryopolis, Pa. With an expert operator, a fully-loaded Michigan negotiates steep grades like this!

Lays pipe

Joe Agostino of Harbor Construction Co., Seattle, says his Michigan 75A "is like my right arm" . . . uses it for back filling, loading, crane work, even lays pipe with a special boom attachment.

Loads underground limestone

Southern California cement producer loads shot rock with a 2¼-yd Michigan 175A. Many underground quarries are doing all loading with Michigans.



Push-loads scraper

In San Jose, Calif., contractor A. J. Raisch mounted a pusher plate on rear of Michigan 175A, uses it for push-loading as well as conventional Tractor Shovel work. Torque converter boosts torque up to 300% as load gets heavier.

Breaks and loads concrete

Contractor Roberts E. Latimer, Jr., Silver Springs, Md., breaks and loads 8-inch concrete slab with a Michigan Model 175A on a District of Columbia job.

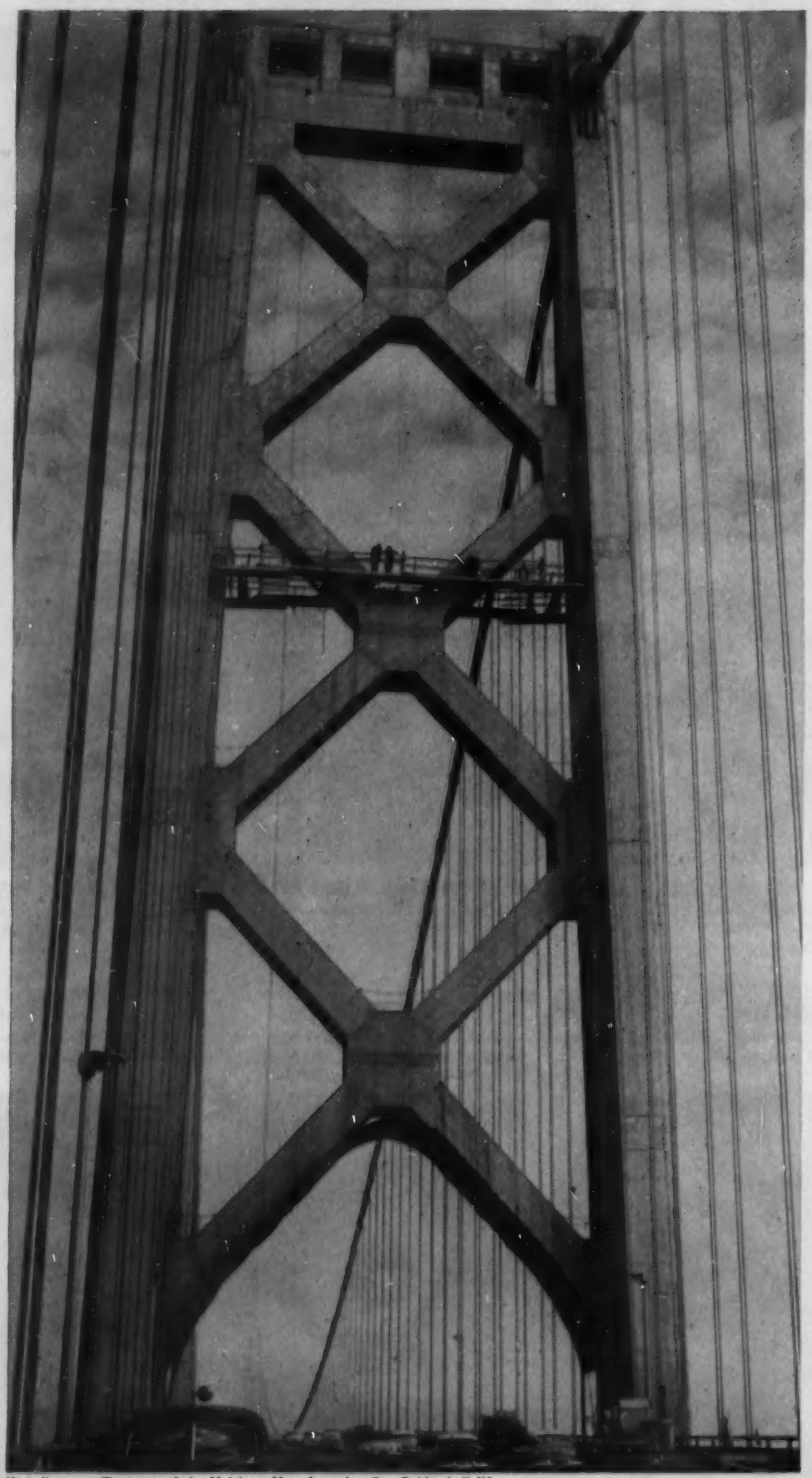
Pulls sheepsfoot compactor

On Austin Company job in Midwest, a Michigan Model 75A handles much of the compacting; on some jobs, the Michigan's big rubber tires provide adequate compaction without a compactor!

Digs bankrun

On-the-job demonstration proved to Windsor Building Supply Co., Newburgh, N. Y., that this 2¼-yd Michigan would outproduce a crawler-loader.

Big bridge gets a steaming hot beauty bath



High Pressure Cleaner made by Malsbary Manufacturing Co., Oakland, Calif.

A typical example of B. F. Goodrich improvement in rubber

To get this 8½-mile-long bridge ready for painting, workmen blast layers of dirt, grease and salt off the metal with high-powered jets of superhot solution. It used to be plenty dangerous. Imagine what would happen to a workman, high up on the scaffold, if a high-pressure steam hose should burst!

And heat used to weaken steam hose. Sometimes it burst at the weakest spot, with explosive force, spraying scalding steam in all directions.

B. F. Goodrich men believed a hose could be made completely *burstproof*. They designed one with layers of fine braided steel wire, then layers of a new kind of heat-resisting rubber, inside, outside and between the braids. Not one length of this hose has ever been known to burst. Even if a hose wears out after years of service, steam can leak out but it cannot explode.

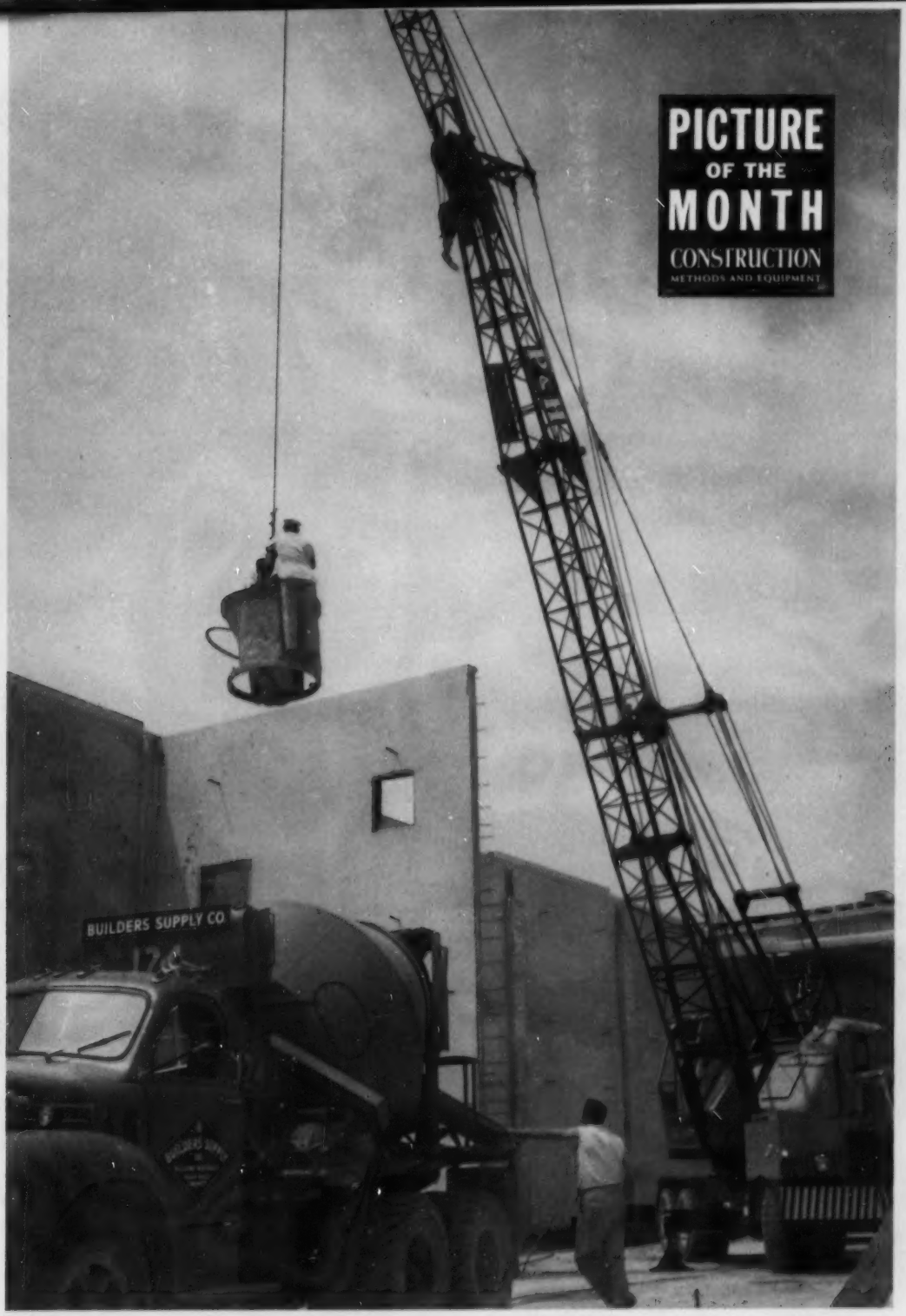
This B. F. Goodrich hose not only stands heat better but wears better. On job after job it has lasted *4 and 5 times* longer than other steam hose. Its rubber cover resists abrasion better than steel. It's 30 per cent lighter than steam hose used to be, more flexible, easier to handle.

B. F. Goodrich has made hundreds of improvements in dozens of kinds of hose to make them last longer, cost less, save your time and money. B. F. Goodrich makes hose to carry almost anything—air hose that stands sharp flying rocks outside and hot oil inside, furnace door hose that stands 3000 degree temperatures, hose that lasts for years carrying gasoline, paints, chemicals, even dry materials such as flour or cement.

Call your B. F. Goodrich distributor for more information about any kind of hose, belting or other rubber products. *B. F. Goodrich Industrial Products Co., Dept. M-668, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS



Fast Work

• Linbeck Construction Corp. of Houston, Tex., is doing a fast job of putting up a $400,000 reinforced concrete storage structure. Schedule calls for completion in only three and a half months. Wall panels averaging 26x18½ ft are erected by the tilt-up method. Welded wire fabric reinforces the floor slab and precast roof panels. Contractor says our photo caught two of his men in too much of a hurry to pour a joint between two panels. Riding the bucket is frowned on by safety-conscious Linbeck management, but sometimes happens anyway.

tips on new tilt-up construction technique

1 Base slab is swept clean and flooded with water to help VISQUEEN film cling smoothly. Ordinary push-brooms take wrinkles out of film. Extra wide VISQUEEN film is used to avoid creases in finished wall.

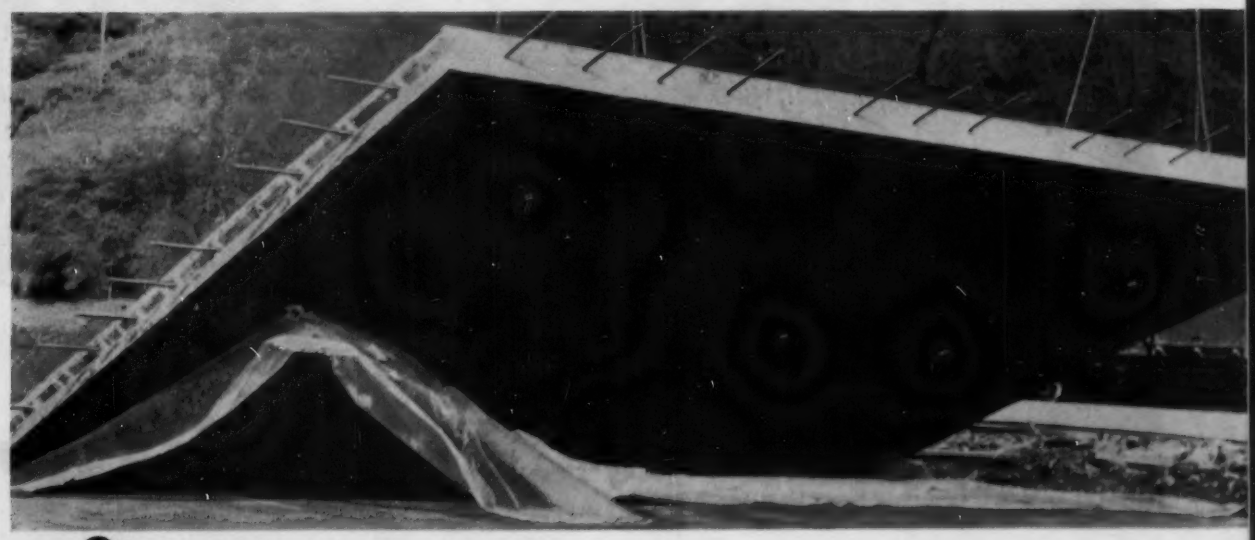
2 New form is built on base slab. Workmen install reinforcing steel on new form and prepare to pour next slab. A smooth sheet of VISQUEEN film makes a perfect bond-breaking membrane workmen can't hurt.

Contractors everywhere find important time and money saving advantages in tilt-up construction methods. Using tough VISQUEEN film as a bond breaker, slabs are lifted quickly, easily. Surfaces are amazingly uniform and reveal a smooth, architectural finish. VISQUEEN film eliminates cracking, sticking and uneven, rough surfaces. What's more, VISQUEEN film is inexpensive. Reduces labor costs, too, because it's so lightweight (1000 sq. ft. of VISQUEEN film weighs less than 10 pounds) and easy to use. Follow the photo story on these pages and see the new advances in tilt-up construction made possible with **VISQUEEN** film.

only VISQUEEN *offers extra* wide widths to make perfect bond-braking membranes.

3 **Minimum time and labor** was required to apply VISQUEEN film bond-breaking membrane and set up new form over base slab. Cement is poured into new form and crew of finishers complete job.

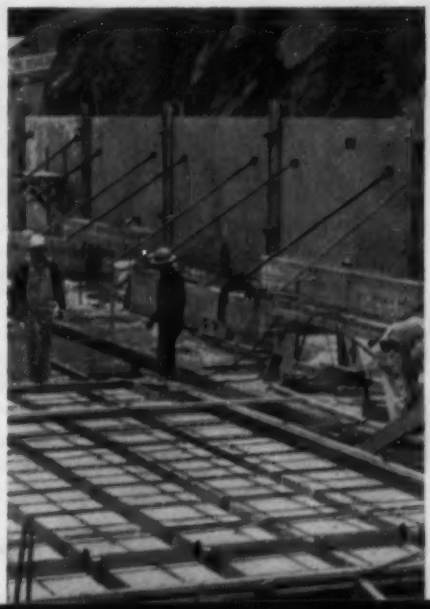
4 **Curing blanket of VISQUEEN film** used to cover newly finished slab. Technique eliminates need for curing compound in cement... prevents checking. No mud dam needed for flooding concrete. No curing compounds to clean up.



5 **Finished slabs** are lifted from base slabs and stacked to one side until needed. Notice bond-breaking membrane of VISQUEEN film between each stacked slab. Slabs, separated by VISQUEEN film, break from base easily, quickly and safely.

6 **Lightweight, sturdy roof sections** are being constructed by the new tilt-up method, too. Cardboard boxes, strengthened with dividers and covered with VISQUEEN film, are placed in the form and reinforcing steel is stretched above and below boxes. Roof sections are covered with curing blanket of VISQUEEN film for even, strong cure. Finished roof sections are lifted from forms and stacked like wall sections until needed. Notice pre-constructed wall sections in place in background.

Write us for name of nearest supplier of VISQUEEN film.



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THE VISKING CORPORATION

World's largest producers of polyethylene sheeting and tubing.

Plastics Division, Terre Haute, Indiana.

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It's time to compare... with LINK-BELT SPEEDER

"First time a shovel has kept us rolling like this!"

Shovel-Crane owners:

New Link-Belt Speeder performance is so outstanding, it has completely revised existing production standards . . .

With competition getting rougher, can you afford to think in terms of outdated production standards? If you aren't using a Link-Belt Speeder or haven't seen one in action recently—it's hard to realize just how much more production . . . more usable net horsepower these new shovels, cranes and hoes offer.

Speed-o-Matic power hydraulic controls—a Link-Belt Speeder exclusive—make every move fast, sure, easy. With them, you can boost output—often as much as 25% or more!

From track treads to boom tip . . . every detail of a Link-Belt Speeder reflects advanced engineering, skilled craftsmanship, precision construction and quality materials.

And look at this list of standard and optional features — independent swing and travel . . . independent rapid boomhoist . . . torque converter . . . third drum . . . reversing clutches for both hoist drums . . . and power hydraulic-actuated swing brake, to mention only a few.

It's good business to *compare now!* See why more and more Link-Belt Speeder owners have completely revised their thinking on how fast a job will go. Your distributor will be pleased to arrange for you to see a new Link-Belt Speeder in action, give you the facts. Call him now! Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

14,108

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

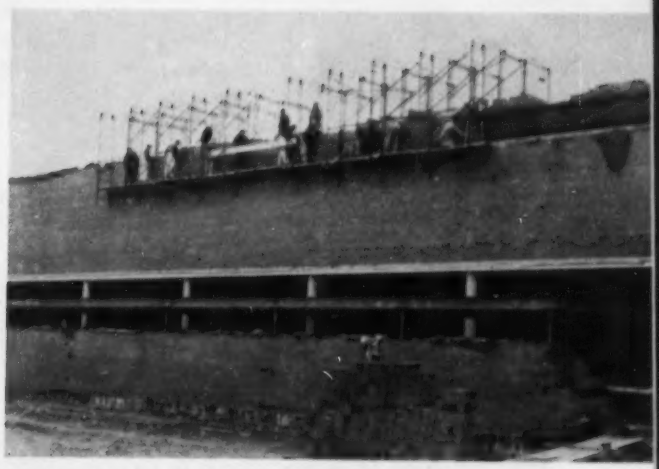
Construction News in Pictures . . .

Forming on High

Glued laminated timber falsework forms the arch centering for the 300-ft span concrete arch ribs of Dog Creek Bridge in northern California. Arch centering consists of two towers and three truss spans. Ukropina-Polich & Kral, contractor on the $737,000 job, says use of these trusses made possible a substantial saving. Timber Structures, Inc., designed and supervised erection of the trusses.

Defense against Waves

Six hundred 33-ton concrete tetrapods like this metal prototype will form a breakwater for Kahului harbor in Hawaii. They are designed to lock arms to form a barrier that will withstand the biggest waves the Pacific can produce. Hawaiian Dredging Co. will place the tetrapods to replace 12-ton rocks the waves carried away. The job is a project of the Corps of Engineers.



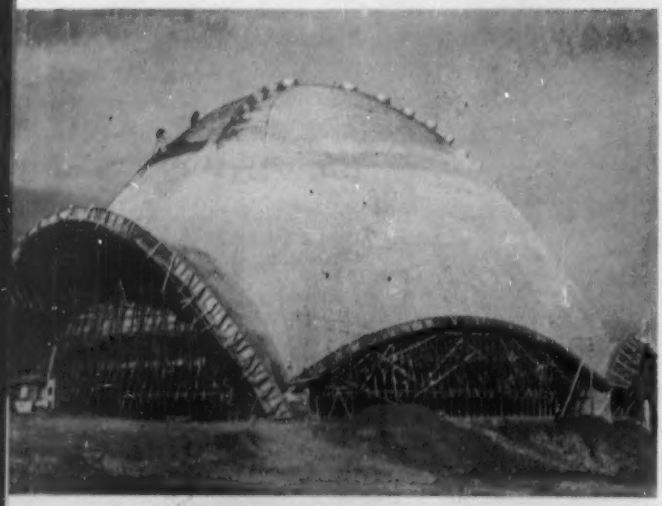
Scaffold Rides on Roof

A rolling scaffold set on the roof gets around the expense of using additional frames because a marquee projects from the wall. Ladder frames hang from the outer end of 16-in. putlogs supported by one row of standard frames and another row of walk-thru frames. The rig rolls along on casters as work progresses. Anchor Masonry Co., Washington, D.C., built the scaffold with 30 Waco standard tubular frames.

(Continued on next page)

Tunnel Worker

Prior to erection of forms and pouring of concrete, a Gradall scales down loose rock from the sides and top of a diversion tunnel cut through solid granite around Beardsley Dam on the Stanislaus River in central California. Contract for the $31 million project is held by a joint venture of Morrison-Knudsen Co., Inc., Peter Kiewit Sons Co., Macco Corp., and Paramount and Stolte, Inc.



Domed Church

Thin-shell dome for a new church in Oklahoma City, Okla., is built up on wood forms supported on Patent tubular scaffolding. The concrete shell is 89 ft high and varies in thickness from 7½ in. at the base to 3½ in. at the crown. Concrete is applied by a True Gun-All machine. Frederickson-Parks, Inc., is the contractor.

A Time-Saver

Construction men on San Diego Gas & Electric Co.'s powerhouse project save time by riding a manlift instead of climbing stairs. The lift mounts 22 one-man steps on a 16-in. endless belt driven by a 5 hp motor through a reduction gear. Its travel speed is 75 fpm. It was built by the Stephens-Adamson Mfg. Co., Los Angeles.

NEW! a cost-cutting drill for the push-button age!

the JOY JUNIOR CHALLENGER

BIG-DRILL FOOTAGE...LOWER LABOR COST...LESS TIME BETWEEN HOLES

Our customers asked for a brute of a drill on a mobile, "push-button" carriage. In other words, they wanted more hole at less labor cost, shorter time between holes, and faster set-ups. Here's our answer: the self-propelled *Joy Junior Challenger* . . . the FIRST COMPLETELY POWER-OPERATED WAGON DRILL ever produced. It drills anywhere, in any position, in any formation. The operator has nothing much to do but think, and change steels. Here are a few of the reasons why the Junior Challenger will cut costs on your job:

ALL POWER OPERATION—All movements of feed, drill, and carriage are hydraulic or air-powered—no chuck wrench necessary.

DRILLS AT ANY ANGLE—Vertical bench hole, toe holes, horizontal holes, and angle holes both up and down from the horizontal.

RIGID ALIGNMENT—Feed is supported by *two* trunnions, will not vibrate or move out of line.

STABILITY—Treads move independently up or down to conform with terrain, then are locked simply by turning a valve.

NEW HEAVY-DUTY 4½" DRIFTER—Has features found on no competitive machine; drills up to 3½" holes to 40 ft. depth *in any formation.*

SECTIONAL STEEL—1¾" round steel system, sectional type with detachable striking bar, has ⅝" o.d. air tube for outstanding hole-cleaning ability.

Write for complete information to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ont.*

SPECIFICATIONS

Easily drills up to 3½" holes to 40 ft. depth in any formation.

Drills horizontal holes to 7½ ft. height.

Write for FREE Bulletin 87-23

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for AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS
CORE DRILLS • BLAST HOLE DRILLS
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JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY

How to Set Down Only One Pound of a Nine-Ton Load!

Hydrocrane Does It with Precision Hydraulic Control

1 Hydrocrane's control is so fine that load movement can be almost imperceptible to the eye. Here a 9-ton load is lowered to ordinary household scale on table.

Take a good look at this remarkable demonstration of Hydrocrane control, then picture a Hydrocrane at work for you. For setting beams or concrete slabs, pouring cement or setting a plate glass window — *any* job that requires hairline control — nothing can beat the Hydrocrane in saving you time and money.

The all-hydraulic Hydrocrane is an expert at working in close quarters, too. It has the shortest tail swing, size for size, of any revolving crane, and its unique telescoping boom can reach out and poke a load into hard-to-get-at places.

Contractors who own Hydrocranes call them, "the handiest machine we have." You'll say so too when you get all the facts from your Bucyrus-Erie distributor. Do it soon.

SEEING IS BELIEVING!

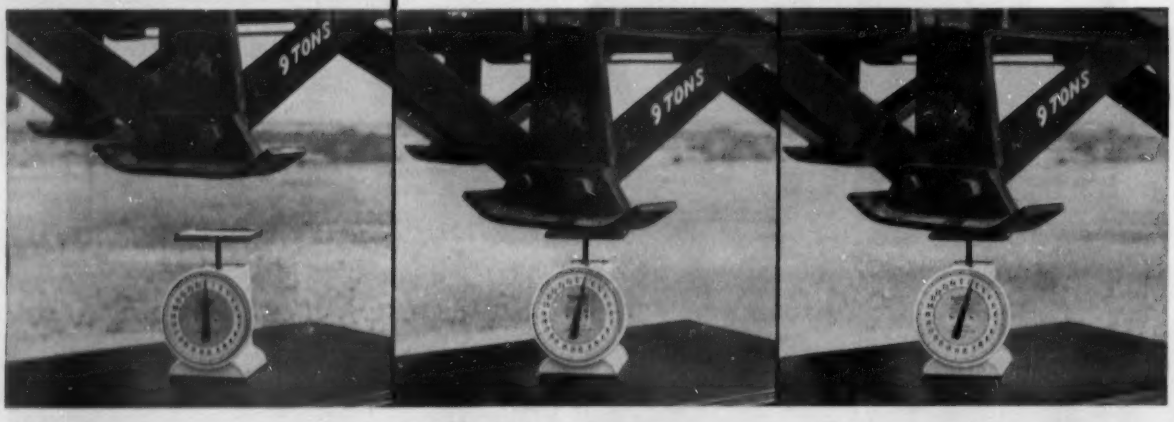
The experiments shown here were made with a standard 9-ton capacity H-5 Hydrocrane at Bucyrus-Erie's test and research grounds near South Milwaukee. The sled and billets, being lifted, totaled 18,363 pounds when weighed on a certified scale. Note that this is *the maximum rated lifting capacity* for this crane — hardly favorable conditions for such a test! 114H56

H-3 HYDROCRANE • 4-ton, ⅜-yard

H-5 HYDROCRANE • 9-ton, ½-yard

BUCYRUS ERIE

South Milwaukee, Wisconsin



2 Closer and closer it comes. No jerks — just a carefully controlled movement as load nears scale.

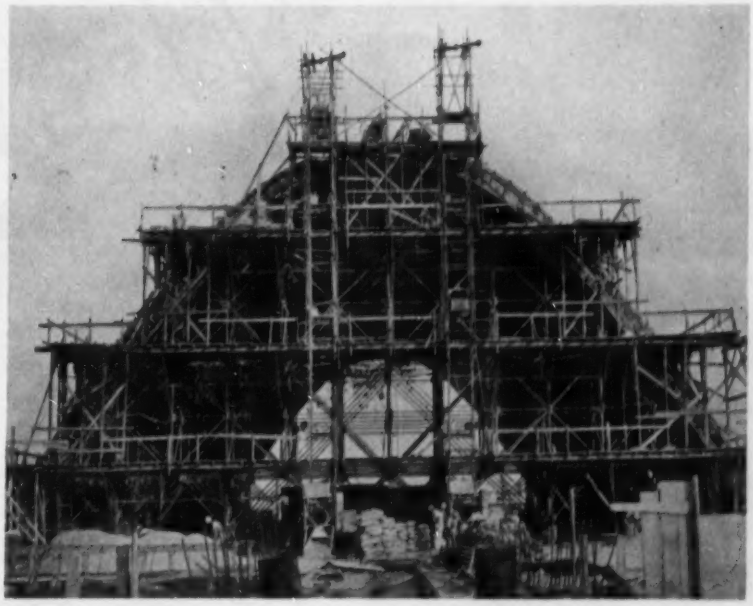
3 Contact! And so-o-o easy that scale registers only one pound of that big 9-ton load. That's precision control in action!

4 Now the operator "feathers" his control lever a hair, and look—the scale pointer moves to a pound and a quarter!

Construction 'Round the World . . .

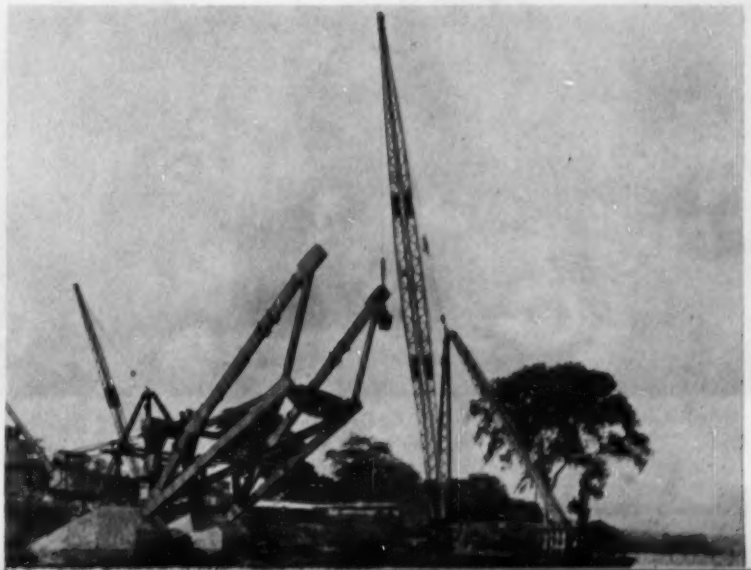
In Singapore

A total of 366 prestressed concrete beams go into the 2,000-ft Kallang Bridge. Bridge has 25 spans, each 80 ft long. Beams are cast in six reinforced concrete casting beds supported by piles. Wide foundations will allow future widening of the deck. The Australian firm, Humes Industries, Ltd., is building the bridge through a subsidiary.



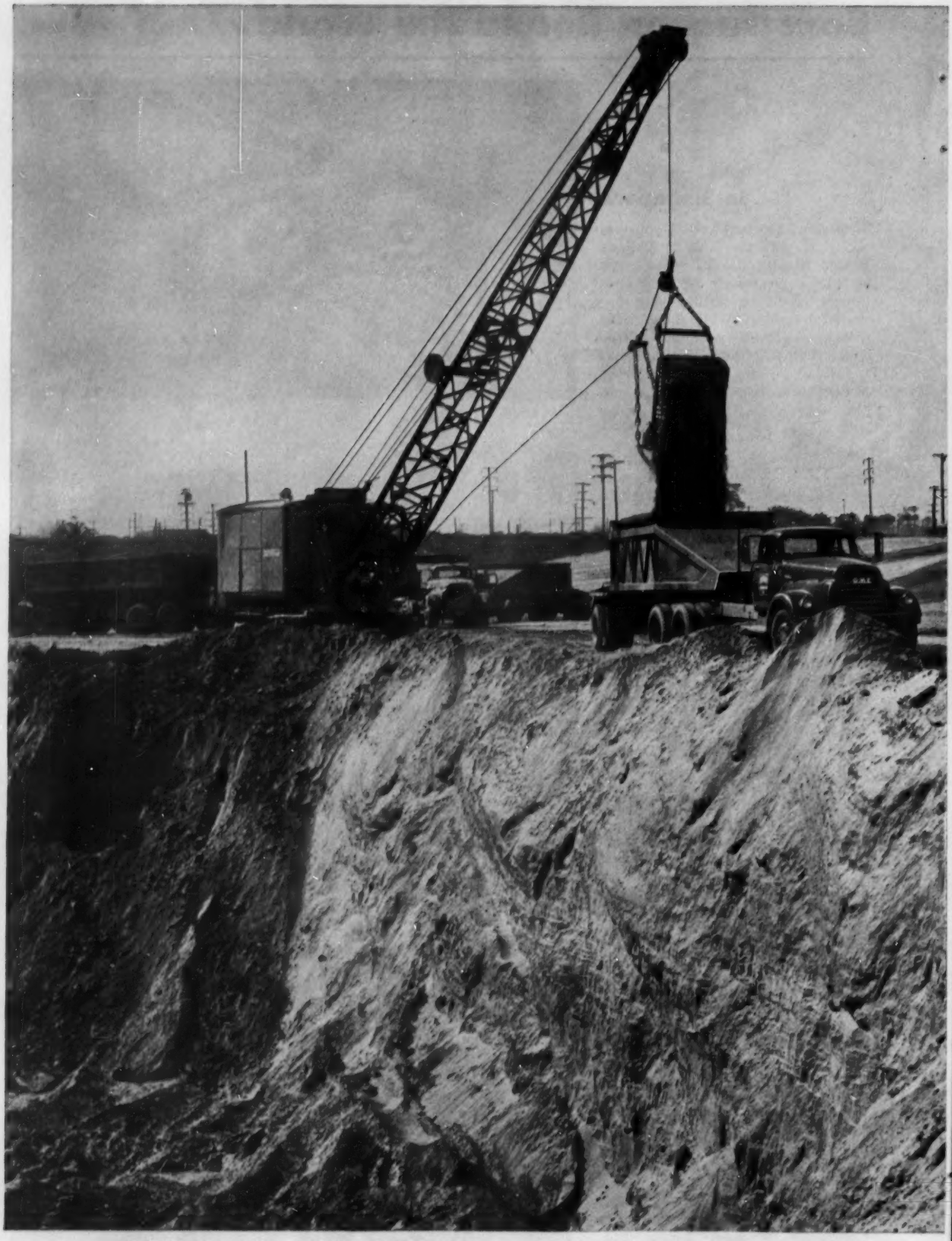
In Africa

The first bridge ever built across the Volta River is going up near Adomi, 70 miles from the mouth of the river in the Gold Coast. It will consist of a single 805-ft span. The center of the arch will be 200 ft above the water. Approaches on each side consist of three 50-ft concrete spans. The 5-ton arch sections are welded in Britain and shipped to the site ready for bolting. Contractor is British firm, Dorman Long.



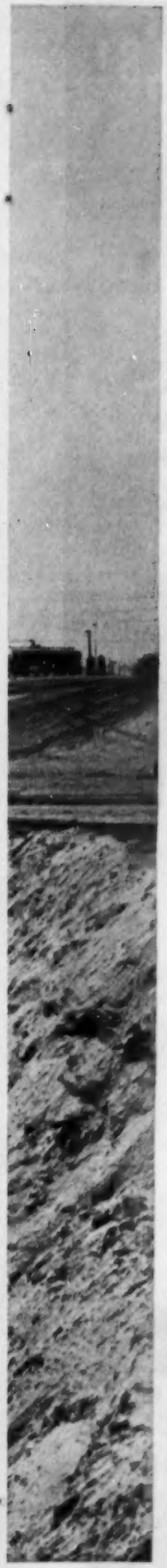
In Israel

Using movable forms, the contractor for this $550,000 storage building in Haifa casts 30-ft parabolic arches in one operation. The shell is 6 in. thick and is supported by reinforced concrete ribs spaced at 7½-ft intervals. Building is 330 ft long and 53 ft high. It has a storage area of 36,000 sq ft. Contractor is Solel Boneh, Ltd., working under the supervision of Cementation Co. of Great Britain.



A TEAM OF 46 GMC's HAULING SEMI-TRAILER DUMPS are hustling "fill" for this multimillion-ton job. GMC's new Blue Chip heavy-duty line is engineered to meet *any* requirement up to 63,000 GVW-90,000 GCW. Model W630's are rated at 65,000 GCW and with 34,000-lb. tandem axles.

(Advertisement)



"We've delivered 3 million tons of 'fill' to keep a sinking island afloat!"

Here's Asbury Transportation's story on their giant Terminal Island, California, job—and the part played by their 46 GMC trucks.

Terminal Island – Long Beach, California, harbor and site of rich-producing oil wells – has been sinking into the sea at the rate of two and a half feet a year.

Naturally, there's hot competition for the huge job of supplying "fill" to keep this island gold mine "afloat." Asbury Transportation willingly shaded their bid very close to land the contract for supplying three million tons in the past three years. After all, there's an estimated 12 million tons still needed over the next decade.

Forty-four new GMC tandems and 2 four-wheelers were assigned to the job. "We had to be sure of completely dependable equipment to take on one like this," owner Al Eyraud declares.

"Even a few delays and a large part of the profits go out the window."

Actually, the GMC's have done better than expected. Maintenance costs over the three years of hard service have been remarkably low. Rear-end troubles—common in this kind of on-and-off-the-road work—have been nonexistent.

And gas mileage—despite "green" drivers and much hauling through Los Angeles traffic—has been a remarkable 4 miles per gallon.

Yet there's nothing remarkable about Asbury's experience with GMC's. You'll find them—gasoline or Diesel—saving time and cutting costs on many of America's biggest construction jobs. *And many of them have the smallest price tags of any truck in their weight class.*

Come see for yourself—at your GMC dealer's!

GMC TRUCK & COACH—*A General Motors Division*

LOADED, WEIGHED AND OUT OF THE PIT IN 3 MINUTES, these GMC's get their crackling pace from GMC's 225-h.p. "503" engine. That's from GMC's great new Blue Chip line of gasoline and Diesel power plants. They team with Safety Power Steering* to ease even the toughest off-the-road work.

WORKING A JOB THAT CALLS FOR 3 MILLION TONS of "fill" in three years, Asbury Transportation's 46 GMC's have chalked up remarkably low operating cost records. And that's typical of GMC owners' experiences – on jobs large and small – the country over!

**Optional at extra cost*

CONTRACTORS! CITY, COUNTY, STATE OFFICIALS! UTILITY, INDUSTRIAL OFFICIALS!

Read this letter before you invest in any construction or maintenance equipment!

City of Oshkosh, Wisconsin
"HEART OF WINNEBAGOLAND"

December 6, 1955

J. P. Waite, Inc.
3304 W. Pierce St.
Milwaukee 15, Wis.

Gentlemen: Att: J. P. Waite

Our Model 2460 Gradall is now about to celebrate its second birthday and I think that it is about time to tell you of the many things we have done with it, and the money it has saved us.

When taking out curb and gutters with the Gradall, we have been able to eliminate an air compressor and 4 men and get the job done much more quickly.

When repairing sewers 10 to 12 feet deep, we are able to eliminate 4 to 5 men and an air compressor and do as much work with one man in one day as we used to do in 3-4 days.

Many times we have removed large tree stumps with just one man and a Gradall in 1-1/2 hours that used to take 3 men and a compressor 1-1/2 days to remove. To date we have removed over 100 stumps.

In widening and grading roads, the Gradall has worked out very satisfactorily, and we are exceptionally pleased with this machine and its versatility.

On certain street repair work where speed in completing the job was important, we have finished in 6 hours with the Gradall work that would have taken street crews a full week to do by hand labor methods.

Our expenditure for maintenance, service calls and replacement parts over a two-year period have totaled only $397.83. In computing the savings in time and money the Gradall has made for us, we feel that this machine has paid for itself in two years.

Yours very truly,
Wm Hubbard
William H. Hubbard, Supt.
City Street Department

An unsolicited letter to a Gradall Distributor

A TYPICAL JOB ON WHICH GRADALL® CUTS COSTS FOR THE CITY OF OSHKOSH

Removing curb and gutter, Gradall first digs out behind curb, breaking it loose without damaging pavement.

It lifts and loads large sections of curb, speeding the job, slashing costs.

4 DIFFERENT GRADALL MODELS—ONE THAT BEST SUITS YOUR REQUIREMENTS!

GRADALL—STANDARD CARRIER

CRAWLER-MOUNTED GRADALL

SELF-PROPELLED GRADALL

RAILROAD GRADALL

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Gradall
DIVISION OF WARNER & SWASEY

Distributors in over 75 principal cities in the United States and Canada

YOU CAN DO IT BETTER, FASTER, FOR LESS WITH A GRADALL

JUNE, 1956

VOLUME 38 • NUMBER 6

HENRY T. PEREZ, Editor

CONSTRUCTION METHODS AND EQUIPMENT

The Contract Method Wins Again

IT CAN COME as no surprise to most construction men that the contract method of construction has once more proved to be more economical than force-account work.

This was brought out in a cost comparison study of five secondary road projects in North Carolina, results of which have just been released by the federal Bureau of Public Roads. BPR figures indicate that actual cost of a state-prosecuted job runs 4% more than the same job done by a contractor. But when certain allowances are made for such things as taxes and fees, the savings under the contract method may run much higher.

BPR made detailed studies of three contract jobs and two force-account jobs. The five totaled 41 mi in length and $735,000 in cost. Records were kept of all expenses and all work performed and were broken down into actual unit prices for the various operations involved.

These unit prices then were applied to a hypothetical composite job, which included a typical quantity for each principal item of work normally expected on a secondary road project of the type studied. This gave a common base of reference.

What was the cost of the composite job? It totaled $139,905 using the state's average unit costs as against $134,572 at the contractors' figures, a margin of $5,333 in favor of the contract method. While the contractor cost does not include profit, a $7,500 salary rate was allowed for owners of the unincorporated construction firms.

These are unadjusted figures. And the BPR report makes other comparisons showing what the composite-job costs would be when certain variables are eliminated (table).

One large difference between force-account and contract work, for example, is the amount expended for such things as taxes, licenses, and fees. With these excluded, composite-job cost with force account is more than 14% higher. An adjustment for different wage rates (averaging $0.975 for the state and $1.23 for the contractors) shows a similar advantage for contract work.

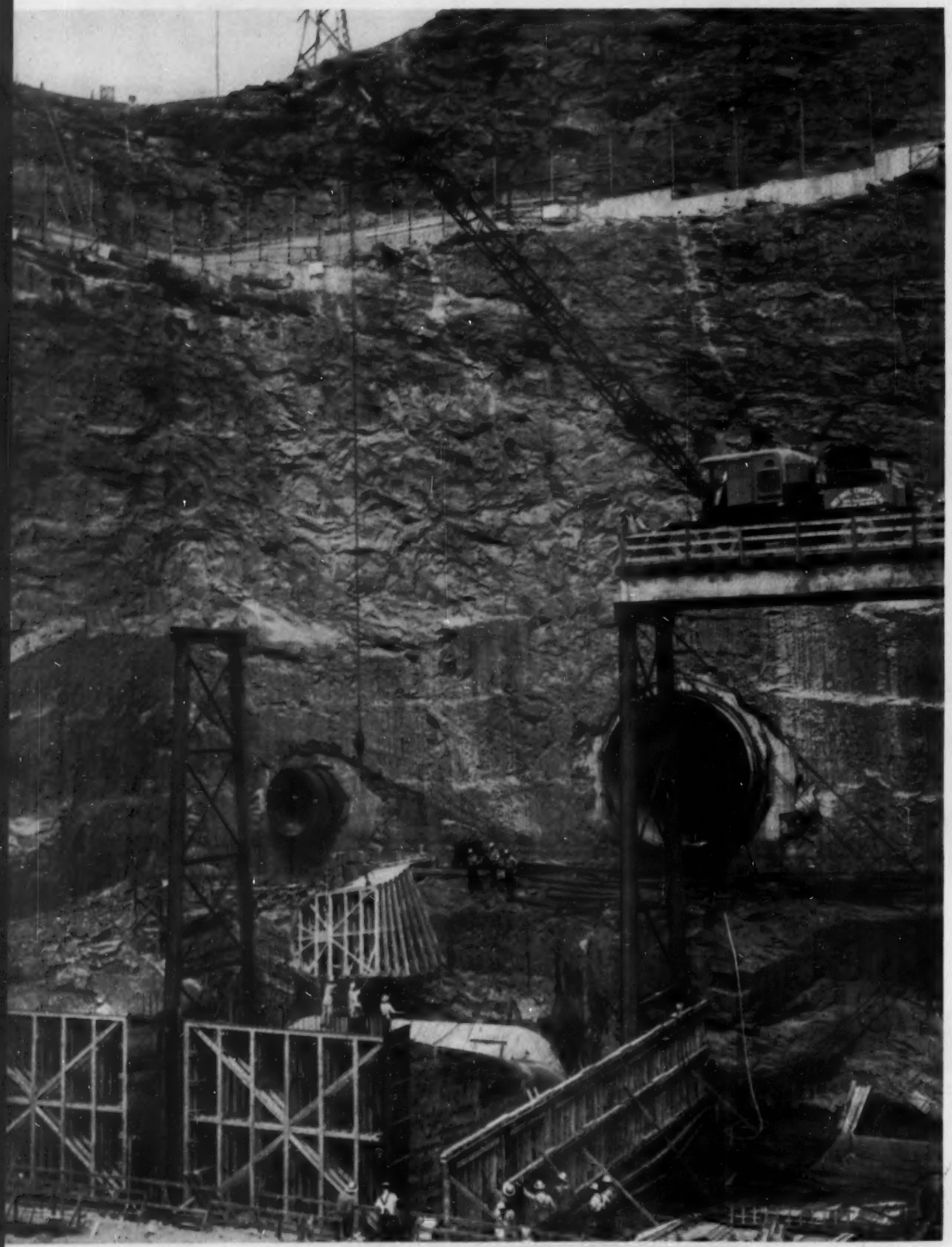
Some of the individual adjustments tend to decrease the original spread of $5,333 between the costs of the composite job. And there are other variables that BPR did not evaluate. But, the report says, "Such computations would not be sufficiently weighted in favor of state work as to alter the finding that, exclusive of profit, contract work was performed at a lower construction cost than state force work on the five jobs studied."

The BPR report makes no attempt to weigh the relative merits of contract and force account methods. Nor does it analyze their social and economic impacts. Yet, strictly on price alone, the contract method has won again.

Effect of certain variables on total composite job cost

Basic Cost: State, $139,905; Contractor, $134,572; Difference, $5,333

Nature of variable	Amount of variable in composite job		Total cost of composite job, after deducting the amount of the variable		
	State	Contract	State	Contract	Difference, in favor of contractors
Taxes, fees, bond	$908	$12,885	$138,997	$121,687	**$17,310**
Benefits and insurance	3,535	2,087	136,370	132,485	**3,885**
Wage rate differential	—	6,440	139,905	128,132	**11,773**
Haul distance differential	—	2,265	139,905	132,307	**7,598**
Base course materials	31,950	28,950	107,955	106,522	**1,433**
Interest on State's investment	2,385	—	137,520	134,572	**2,948**



SECTION of draft-tube form is lowered in place by Lorain truck crane. When tubes are completed, steel scroll case will be assembled on top and connected to huge penstock.

By ALBERT C. SMITH, Associate Editor

How to Build a Draft-Tube Form

FABRICATING a draft-tube form for a hydroelectric powerhouse is a lot like building a ship. You erect an internal frame of ribs and cover it with a skin of warped wood lagging.

On both structures, surface smoothness is one of the chief goals. It determines how well a ship slices through the sea and how swiftly a turbine's discharge water flows through the draft tube.

But contractors are not boat builders, and draft tube work is highly complex. To build forms quickly and economically a contractor must know the following:

- *How to analyze the warped shapes.*
- *How to simplify them for carpenters.*
- *How to mass-produce the parts.*
- *How to cut continually changing rib bevels.*
- *How to fabricate, erect, and place.*

One contractor who has developed some good draft-tube tricks is Ivey Brother Construction Co. of Atlanta, Ga. Ivey has a $3 million powerhouse contract at Buford Dam, Ga., and has completed the draft-tube work in excellent time. In fact, two complete forms were fabricated, assembled, and erected in only eight weeks and at a cost of only $4 per sq ft. And that includes the cost of wrecking the forms.

Both tubes are big. Designed for Frances-type runner turbines rated at 55,000 hp, the tubes are 48 ft wide and 16 ft high at their discharge ends. They narrow down to vertical elbow sections and then warp up to receive the runner's discharge water.

Ivey fabricated the forms in a yard only a short distance from the powerhouse. Instead of making and placing them in one piece, Ivey made up 16 separate sections. This required a lot of handling, but it paid off in several ways. To save the cost of huge cranes or derricks, the contractor had planned the job for only one or

MASS-PRODUCED rib components are assembled on layout table, nailed together, and scribed with circle for cutting.

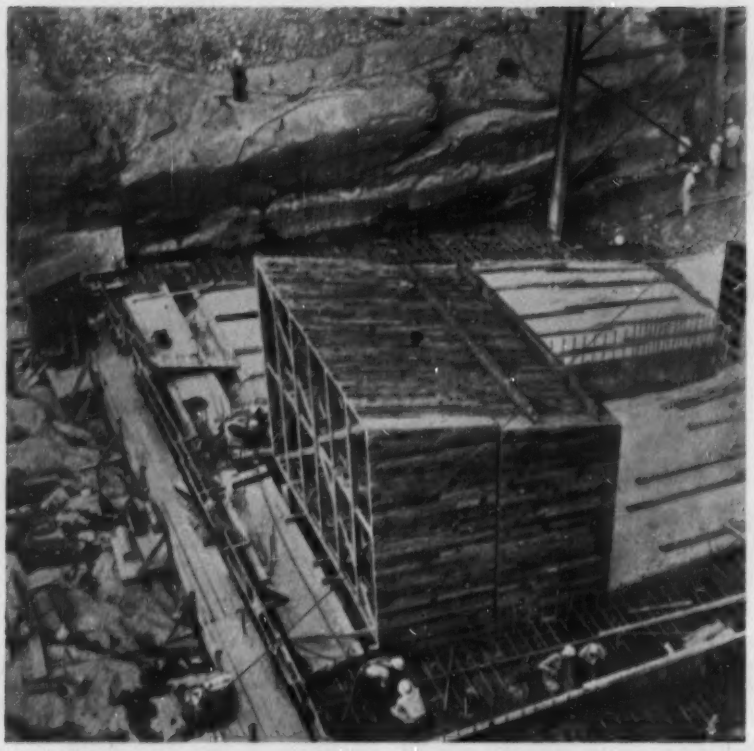
BAND SAW cuts curved rim while changing bevel on quarter-circle rib sections. Rotating saw table adjusts bevel angle.

LAYOUT CREW reassembles rib after rim is cut by band saw. Shop drawings help workmen interpret complex warped shapes.

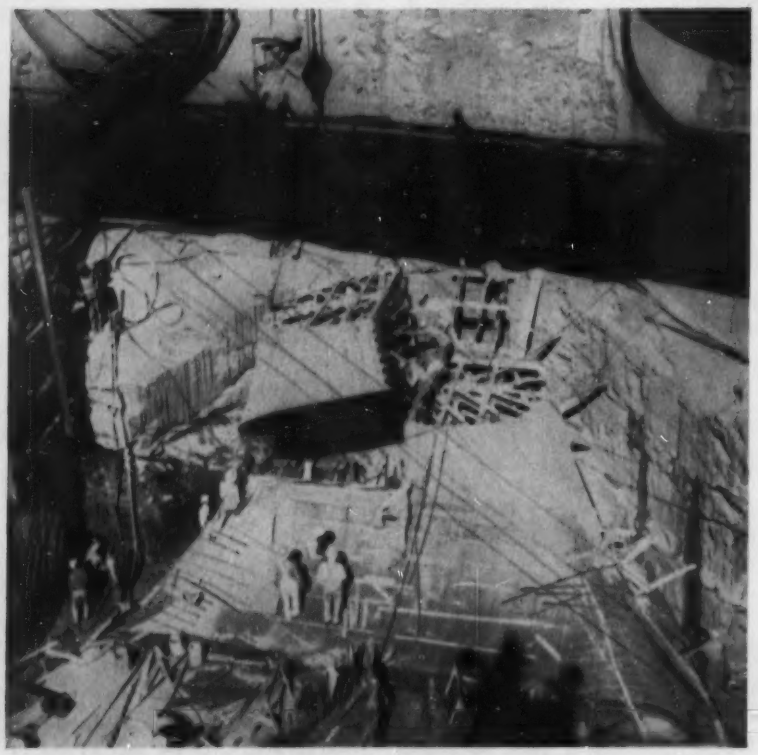
ERECTED RIBS for discharge end of draft tube are positioned and plumbed. Power planes check bevel to assure tight fit.

WOOD LAGGING is nailed to internal frame of ribs. In elbow sections, plywood is nailed over lagging for smoothness.

WARPED SECTIONS are built on end to permit easy access to curved areas. Tubes made of 16 sections weigh 4 to 9 tons.



END SECTIONS of draft tube are placed on foundation at powerhouse site. Joint between adjacent units is made with conventional plaster-board compound and then sandpapered.



ELBOW SECTION is lowered in place by 30-ton truck crane operating from trestle. Job requires one small and two large tubes. Nearly half of form lumber is recovered.

two 30-ton truck cranes. For this reason alone, small lightweight form sections were desirable. Also, breaking up the form permitted fabrication crews to speed their work by building the sections on end, offering good access to all difficult areas.

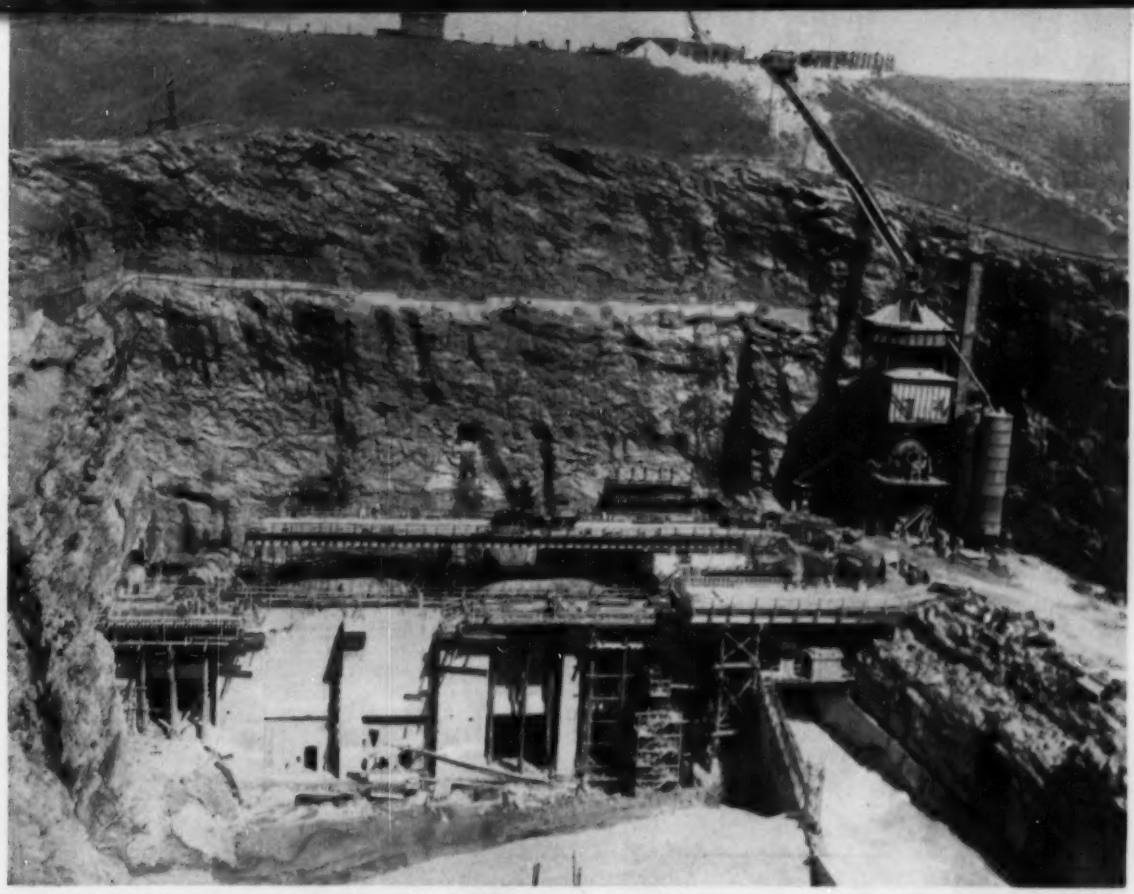
Form building was organized on a mass production system. Crews were trained to do specific jobs and were kept on them until the work was completed. One crew turned out hundreds of rib components on a pair of radial-arm saws; other crews laid out and fabricated. Cutting difficult rib bevels was the job of another group and still another crew erected the form.

The efficiency of the system depended largely on its simplicity. Ivey had assigned his top form designer, George Wallace, to the job of analyzing the complex shapes and developing simple working drawings with which a mass-production system could be organized.

Wallace knew that fabricating the ribs was his main problem. Each tube required about 114 of them, and no two were alike. At the discharge end of each tube, ribs were in the shape of simple rectangles. But as the form narrowed, corners of the ribs had to be rounded. Eventually opposite ends on the two sides took the shape of half-circles. To complicate them still further, the rims of the half-circles required varying bevels to provide flat surfaces to receive wood lagging.

Wallace's plan was to mass-produce rough components of each rib in a saw mill. The pre-cut pieces for the half-circle then were laid on a table, nailed, and brought to a band saw for cutting the circle and the bevel at the same time. The completed circle assembly next was brought back to the table and fitted with interval bracing. Completed ribs then could be erected and covered with lagging.

A major problem was to simplify the job so that carpenters could understand the shapes. Wallace prepared a complete list of components for the saw mill men. He gave them the dimensions of every piece and grouped the items for mass production. Two crews working with a pair of DeWalt radial-arm saws quickly turned out the pieces, marked them with code numbers, and stockpiled them for transfer to the layout areas.



POWERHOUSE rises against high rock face as river flows through temporary sluice channel. Johnson batch plant in corner of huge cut is charged by conveyor running downhill from aggregate stockpile atop dam. Concrete buckets are winched across trestle.

With methods of descriptive geometry, Wallace had determined the bevel angle at a number of points around the edge of each rib. Layout men scribed a circle on the assembled rib and marked the angle of bevel at a number of points. Then the 4½-in. thick rib was brought to a Crescent 36-in. band saw in quarter-circle sections and placed on the saw's adjustable table. If the rib had a reverse bevel, the cut was started at the point of contraflection. Three workmen gradually fed the rib into the band while a fourth slowly rotated the table to position the rib at the proper bevel angle.

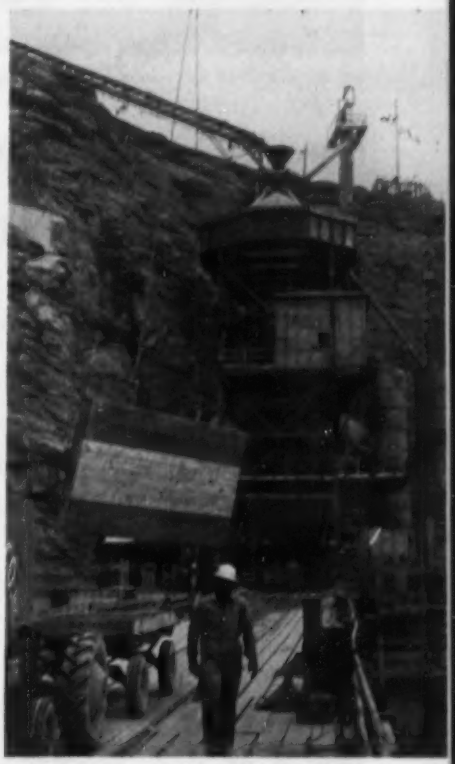
The table man gaged his speed of rotating by listening to one of the other men read the bevel angle as each mark passed the saw. In this way, they cut the complicated changing bevel without difficulty. The same crew operated the band saw during the entire eight-week period and quickly became expert.

When the bevels were cut, ribs were returned to the layout areas where they were completely fabricated. Erection crews pushed hard to keep pace with the fast fabricating crews. To simplify the job, they erected the forms in half-sections set up on their sides. This made them easier to work on because the curved areas were always on top.

Ribs were erected, plumbed, and their bevels checked with power planes. In elbow sections, they were covered with ¾-in. lagging. And to provide the smoothest possible surface, ¼-in. plywood strips 1 ft wide were warped over the lagging. In other sections where smoothness was not as important, the ribs were covered with 1-in. lagging.

As each section was completed, it was hauled to the powerhouse and placed in position with a Lorain 30-ton truck crane. Each draft tube was made of 16 separate sections weighing from 4 to 9 tons each. Joints between adjacent sections were made with simple dry-wall plaster-board compound and then sandpapered. Two large and one small draft tube required 124,000 board ft of lumber, of which 54,000 was recovered.

G. Brandt is project manager, C. Eunice is superintendent, and G. Wallace is project engineer for Ivey Bros. Construction Co. For the Corps of Engineers, U. S. Army, Charles Jackson is resident engineer.



FORM PANEL is swung from trailer to wall. Lifting hooks keep panel hanging plumb.

In the flint-hard permafrost of the Arctic...

Frozen-in-Place Piles Support Air Force Building in Alaska

ARCTIC CONSTRUCTION has produced many novel construction techniques but none stranger than a pile-setting operation at Bethel, about 400 mi west of Anchorage, Alaska.

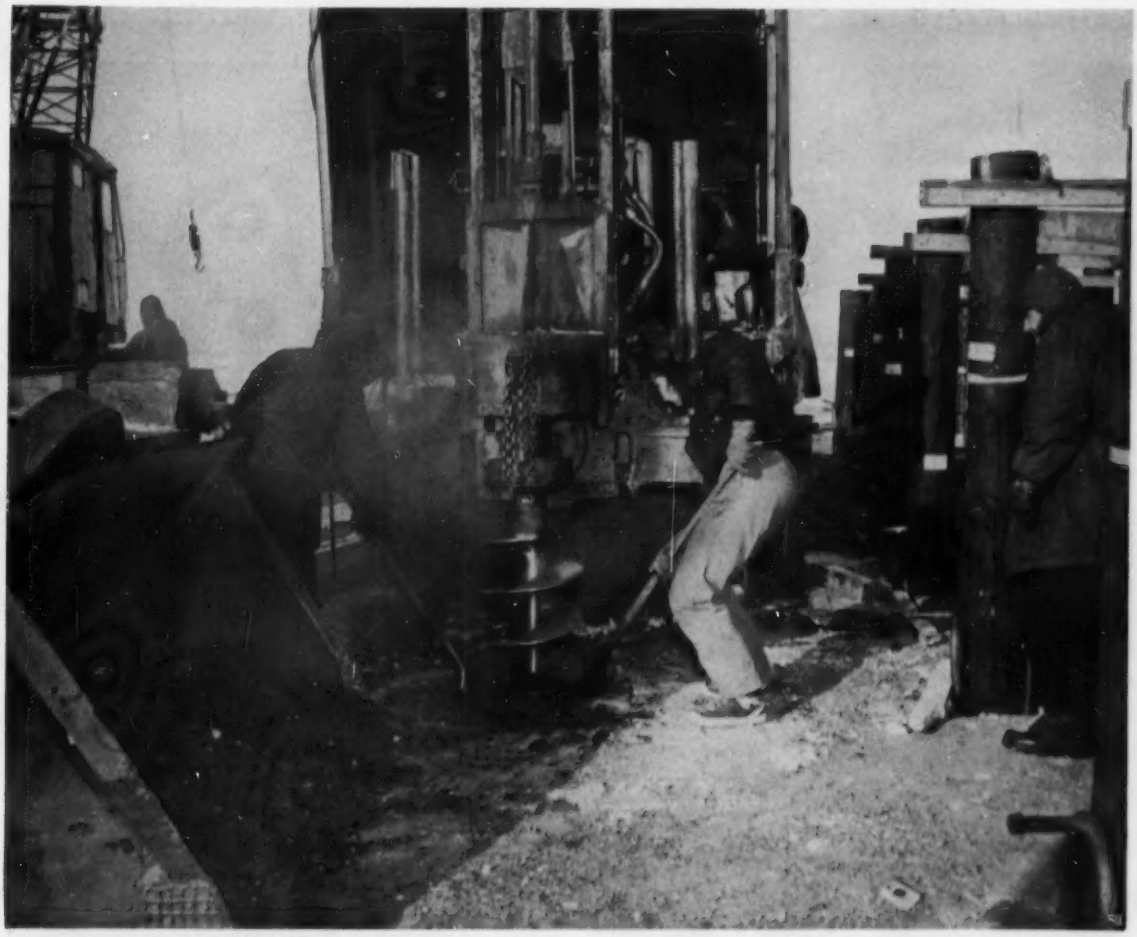
Morrison-Knudsen Co., Inc., and Peter Kiewit Sons' Co., joint venture contractors for the $4 million Bethel Air Force Station, are "deep freezing" into place some 900 piles that will support the main building of the station. To do this, they brought their own refrigeration plant to the frigid, snow-swept Arctic.

First step in the operation is to bore holes 33 ft deep into the underlying permafrost. A special 18-in. dia Alaskaug auger with a cone-shaped bit and special carbide inserts cuts into the hard, abrasive permafrost. The shape of the bit allows the auger to cut a small portion at a time as it is forced into the permafrost.

A crane then lowers a timber pile into the hole. Attached to each pile and extending its entire length are two sets of refrigeration pipe. These pipes are connected to a specially built refrigeration unit with a 50-hp motor.

When the pile is in place, the hole is backfilled with a slurry of water and drill cuttings. Then calcium chloride brine with a temperature of −5 deg is pumped through the pipes to freeze the slurry around the pile. Even in the usual bitter cold winter weather at Bethel, it takes about 32 hr to freeze the slurry.

From the refrigeration plant, the brine is pumped through a 3-in. line to a "T" where it enters two 2½-in. lines of flexible hose. Then, it flows to manifolds of 2-in. rigid pipe, fitted at 4-ft intervals with connections for 1-in. flexible hose which connect to the intake side of



BORING HOLES — A special 18-in. dia earth auger bores holes 33 ft deep for the 900 piles that will support the building. Workmen shovel soil cuttings into front-end loader which hauls them to the slurry mixing shed for processing.

SLURRY MIXING — A standard Jaeger mixer with an oil burner attachment melts and mixes soil cuttings into slurry.

SETTING PILES — P&H truck crane carries piles with refrigeration pipes attached from assembly yard to the prepared holes.

DUMPING SLURRY — Buggy hauls slurry from mixing shed and dumps it around pile. Slurry is vibrated as it is placed.

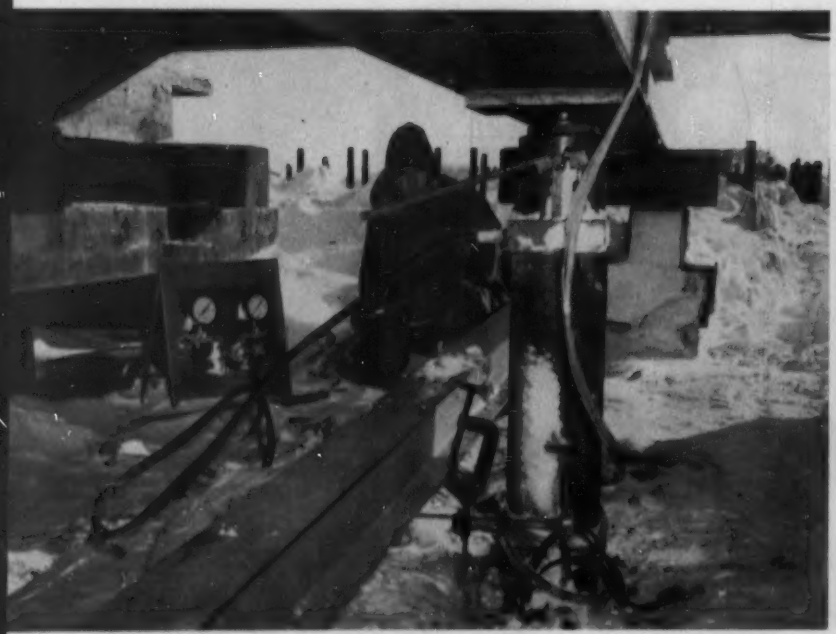
FREEZING THE PILES — Brine from refrigeration plant flows through headers to lead hoses connecting to coils.

the piling coils. The return system is identical.

An interesting feature of the system is that at times the refrigeration plant actually adds heat to the brine because of the extremely low temperatures outside. At one time brine was leaving the refrigeration plant at –5 deg and coming back at –15 deg.

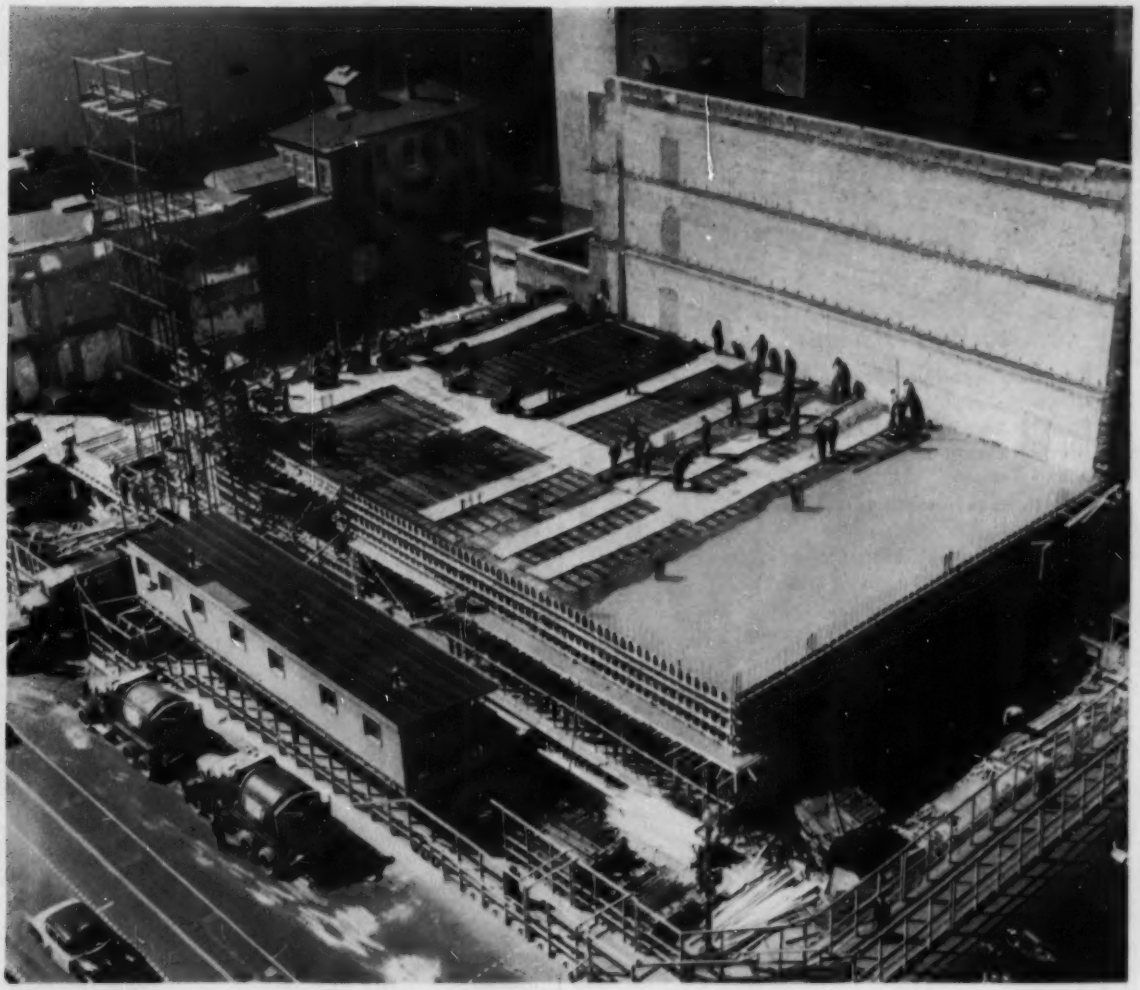
The joint venture contractors began work at Bethel last autumn. The job is scheduled for completion by the end of this year. Main building at the station is a one- and two-story, multi-winged structure that will house a mess hall, dormitories, offices, and recreation areas. Also included in the contract are towers, steam and power plants, roads, and smaller structures.

Project superintendent is Sam Benn; George W. Nourse is supervising project engineer; and Ralph Morova is project engineer. Harold D. DeWitt is project engineer for the U.S. Army Corps of Engineers. Col. Carl Y. Farrell is Alaska District Engineer.



TESTING — After pile is frozen in place, engineers conduct 60-ton load test. Here Air Force representative Milon Essogher measures strength of a test pile.

FRIGHTENING — Workmen wear masks to guard their faces against cold.



When you must brace an adjoining party wall before underpinning it . . .

First Top Out Building — Then Complete Foundation

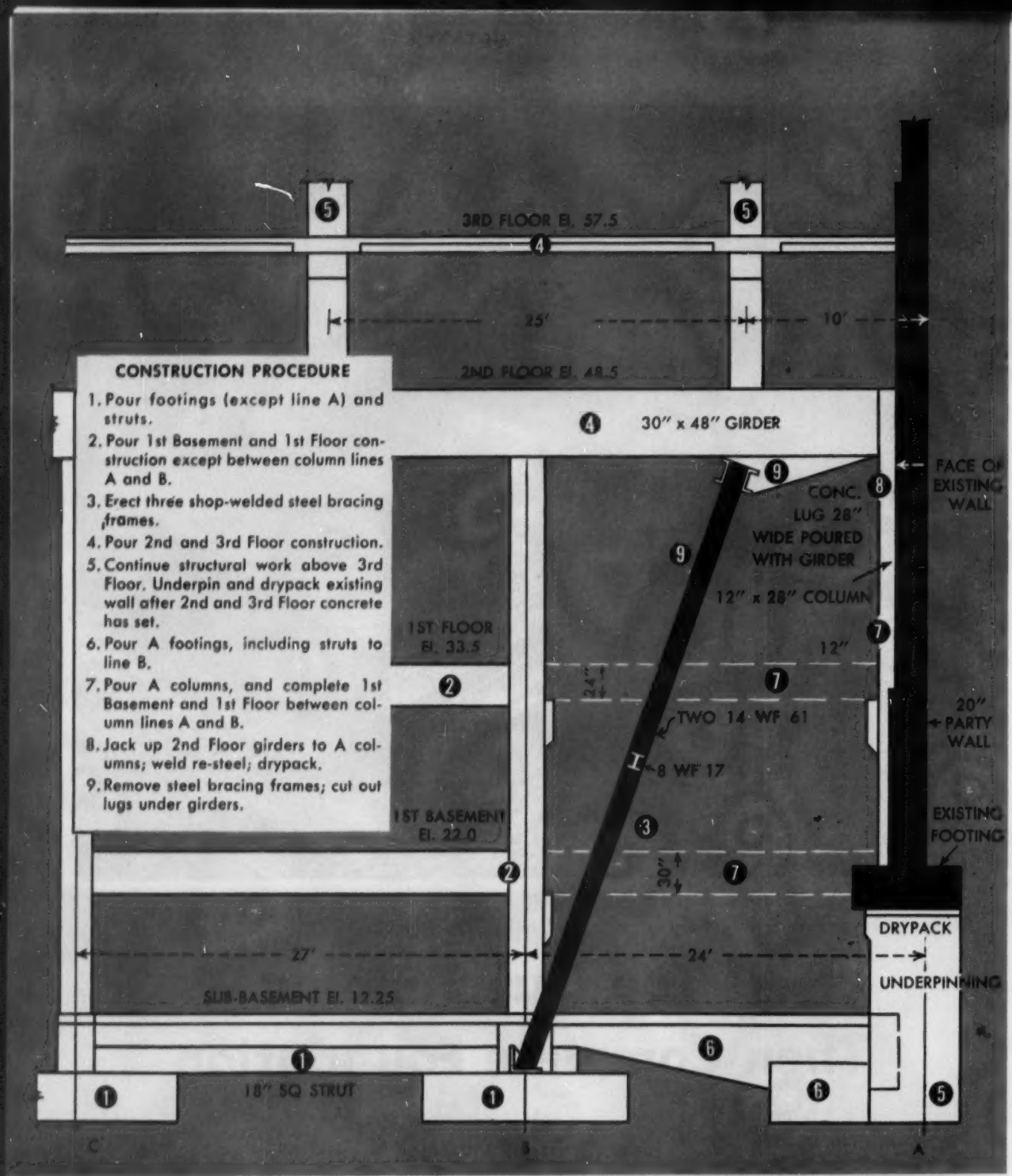
By CHARLES W. HUMPHREYS,
Project Manager,
William P. Lipscomb Co., Inc.

A UNIQUE METHOD of bracing a perilously unstable four-story brick party wall while underpinning it 14 ft solved a tricky problem for William P. Lipscomb Co., Inc., Washington, D.C., in construction of a $1 million curved-ramp parking garage and store building in Washington.

The new five-story building occupies the site of a seven-story building erected about 1883. It adjoins a four-story retail store building built about 40 years ago between two party walls. After foundation work for the new Margold Building was well under way, we discovered that the wood floor joists and rafters spanning the 25-ft width of the adjoining building had been set in holes cut in both party walls without attaching joist anchors or any other form of anchorage or ties to hold the walls together.

But plans for the Margold Building called for a sub-basement. This meant removing a berm of earth 24 x 98 ft along the party wall to a depth of 14 ft and extending the party wall down in concrete underpinning. The District of Columbia Building Department flatly refused to allow the party wall to be underpinned until it was adequately braced because of the hazardous condition of the wall once demolition had removed the bracing provided by the old building on the Margold site.

It proved to be no easy task to design an acceptable bracing system. The D.C. Building Depart-


CONSTRUCTION PROCEDURE
1. Pour footings (except line A) and struts.
2. Pour 1st Basement and 1st Floor construction except between column lines A and B.
3. Erect three shop-welded steel bracing frames.
4. Pour 2nd and 3rd Floor construction.
5. Continue structural work above 3rd Floor. Underpin and drypack existing wall after 2nd and 3rd Floor concrete has set.
6. Pour A footings, including struts to line B.
7. Pour A columns, and complete 1st Basement and 1st Floor between column lines A and B.
8. Jack up 2nd Floor girders to A columns; weld re-steel; drypack.
9. Remove steel bracing frames; cut out lugs under girders.
3RD FLOOR El. 57.5
2ND FLOOR El. 48.5
1ST FLOOR El. 33.5
1ST BASEMENT El. 22.0
SUB-BASEMENT El. 12.25
25'
10'
27'
24'
30" x 48" GIRDER
CONC. LUG 28" WIDE POURED WITH GIRDER
12" x 28" COLUMN
TWO 14 WF 61
8 WF 17
18" SQ STRUT
FACE OF EXISTING WALL
20" PARTY WALL
EXISTING FOOTING
DRYPACK
UNDERPINNING
12"
24"
30"

UNIQUE BRACING METHOD . . . Continued

ment did approve a system of long, threaded steel rods with turnbuckles at calculated spacing running through the building from outside to outside and fitted with proper end anchorages. This would have been easy to erect and inexpensive. But the store owner objected; he insisted that any bracing should be done from the Margold Building side of the wall. Under District of Columbia law, he was within his rights.

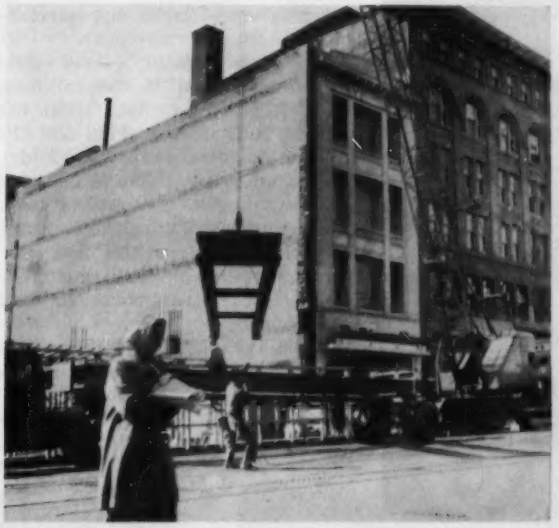
The D.C. Building Department rejected several other carefully detailed bracing designs before it approved one. Essentially the approved design consisted of temporary steel column bents to support the ends of the second floor girders near the party wall and carry all floors from the second to the roof.

The steel bents were placed at an angle and rested on the first line of column footings away from the party wall. These footings were designed to carry the additional load.

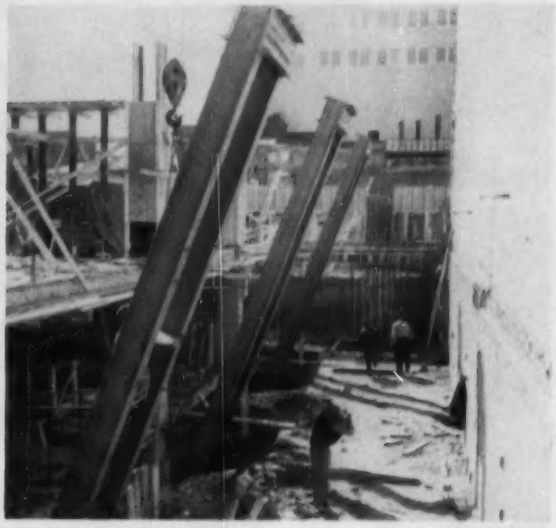
We left out temporarily four bays of construction along the party wall at the basement and first floor levels while running up and topping out the construction

FOUNDATION WALL and berm of earth 24 ft wide cannot be removed for sub-basement until party wall is braced and underpinned.

FOUR BAYS of floor construction nearest party wall are left out (right). Work will begin there when wall is underpinned.



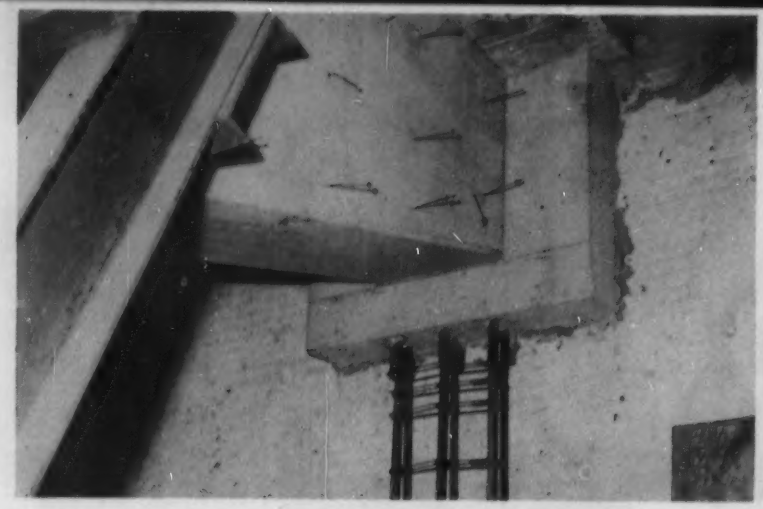
TRUCK CRANE booms down to place 38-ft-long steel column bents in position where they are tied back to permanent columns.



COLUMN FOOTINGS in first line from party wall carry load from permanent columns plus load from temporary column bents.

SECOND FLOOR GIRDERS, supported on temporary steel column bents, brace the party wall and permit underpinning to begin.

UNDERPINNING is completed, and basement floor, the first supported floor, is poured over the sub-basement and finished.



WALL COLUMN STEEL is tied to dowels in the bottom of a square concrete jacking plate at the end of a second floor girder, then concrete for column is poured.

FLARED TOP provides jacking haunch. Jacks take up load while column steel is welded to dowels, footings are pre-stressed, and column tops are layed-up and dry packed.

UNIQUE BRACING METHODS...
Continued

from the second floor to the roof. This braced the party wall adequately. Underpinning began when second and third floor concrete had set. Completing work on the four bays at the basement and first floor levels—including column footings, columns, beams, and slabs—presented no problem.

Before the temporary steel columns were removed, we built up the wall columns supporting the second floor girders a sufficient distance to accommodate hydraulic jacks for pre-stressing the column footings. The heads of these wall columns were flared out horizontally to support the jacks.

The jacks took up a load equal to the total load on the columns. We left them in place until the column rods were welded and the column tops keyed-up and dry packed. Keying up the concrete columns under the second floor girders and removing the hydraulic jacks transferred the load from the temporary steel columns to the permanent concrete columns. Then we removed the steel bents.

Since completion of the structure, there has been no evidence of settlement or shrinkage.

Architect for the project was A. R. Clas. His associate, George Riggs, was in direct charge of the work. Otto Vogt was the structural engineer. W. G. Feller was superintendent for the contractor, and the author was project manager.

COMPLETED COLUMN now carries its full load without shrinkage or settlement.

COLORED aluminum panels cover concrete frame of structure. Building houses four retail stores on the ground floor as well as a 400-car parking garage.

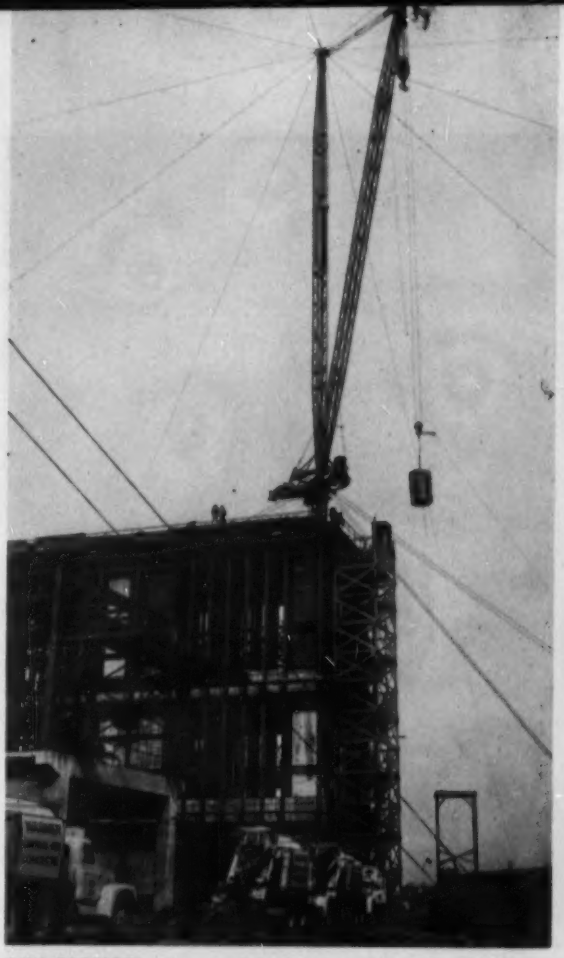
Pumpcrete Rigs Help Derrick Pour High Slab

A GUY DERRICK teamed with two Pumpcrete machines to pour an 825-yd floor slab 95 ft in the air. In only 10 hr, they placed the 8-ft thick mat of concrete on top of the fluid coke unit at Tide Water Oil Company's huge new refinery near Wilmington, Del. General contractor is C. F. Braun & Co. of Alhambra, Calif.

Because of the huge amount of concrete, the pour had to be controlled rigidly to prevent an unbalanced build up that might damage the stability of the supporting steel framework underneath. In fact, the maximum allowable difference of concrete elevation during the pour was only one foot.

On the lower floors, Braun placed concrete with crawler cranes. But this method would have been too slow on the high slab. Instead, the contractor set up two Pumpcrete machines near the base of the structure and ran 8-in. pipes to the top. At the end of each pipe, a swivel chute rotated in a full circle to spread the concrete evenly. Areas that could not be reached with the swivel were filled with a 6-yd bucket swung from a 315-ft high guy derrick. All concrete was supplied by ready-mix trucks.

Paul Terry is project engineer, and Sweeney Tuck is general superintendent for C. F. Braun & Co.



GUY DERRICK swings 6-yd bucket over big slab. Concrete is poured into elephant trunks positioned in maze of reinforcing. Rods up to 2¼ in. are butt-welded to provide maximum space.

PAIR of ready-mix trucks chute concrete directly into Pumpcrete hopper. Mix is pumped 95 ft high and distributed evenly by full-circle swivel chute. Because of cool weather, no refrigerating is required. Concrete with 4-in. slump pumps easily.

HELICOPTER transports survey crews and equipment and pulls measurement chains from stake to stake through the marshland.

DREDGE digs canal 40 ft wide and 8 ft deep to provide access for pipe-laying barges that will place the 355-mi gas pipeline.

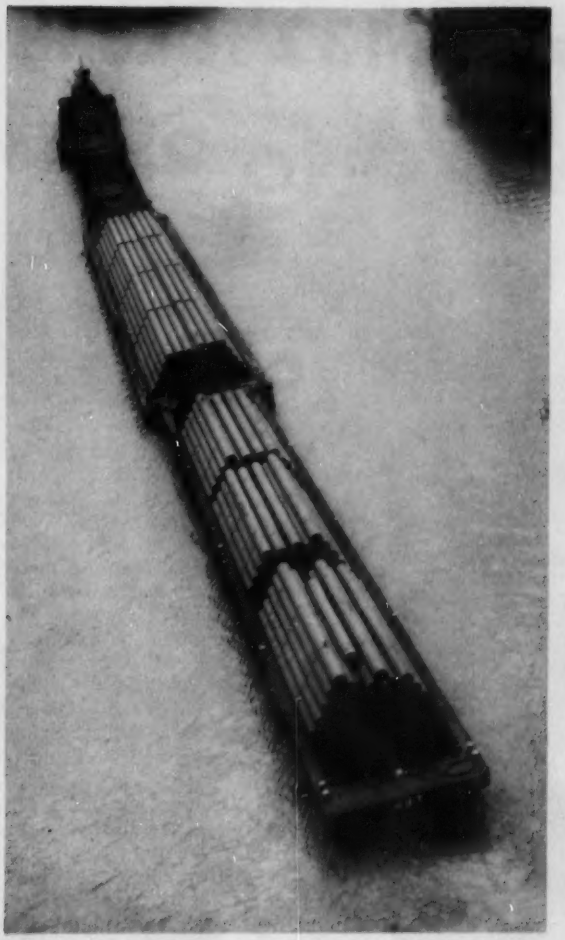
BARGE lays pipe in 40-ft lengths in a 4-ft ditch at the bottom of the canal.

Contractors Lay Gulf Coast Pipeline By Air, Land, Sea

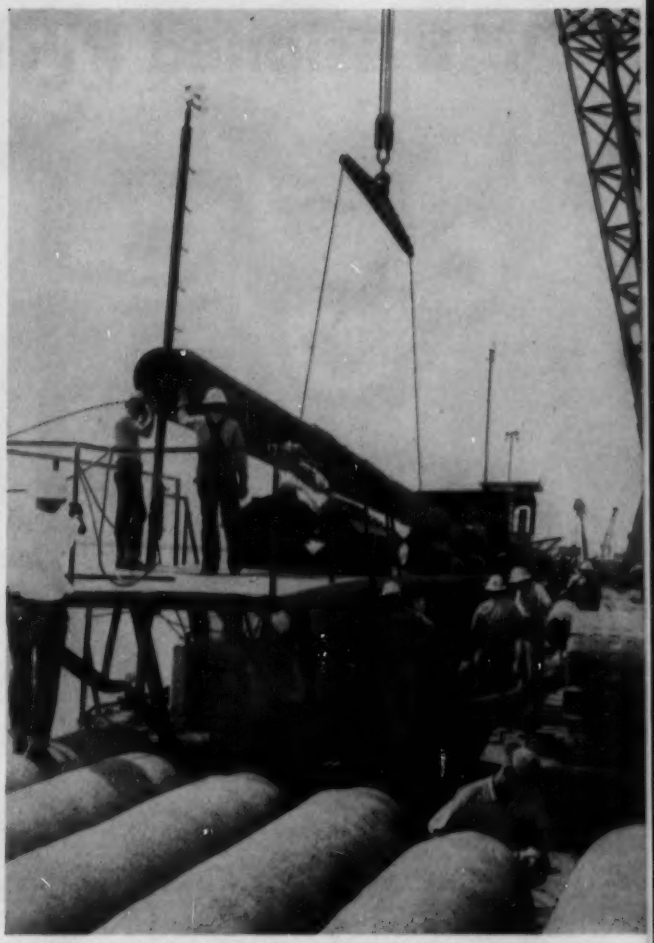
PIPE-LAYING BARGES, working in canals dredged through marshlands along the Louisiana coast, are laying a 355-mi natural gas pipeline for Tennessee Gas Transmission Co.'s gathering system.

Nearly four-fifths of the pipeline —called the "Muskrat Line"—will lie under water. It runs through marshy lowlands that cannot support construction equipment, and it must cross 130 navigable bodies of water. So contractors chose to work from specially built barges equipped with cranes, welding stations, and facilities for coating and wrapping the welded joints.

Dredges dig canals 40 ft wide and 8 ft deep for the barges. Pipe in 40-ft lengths with a 2½-in. coating of concrete is delivered to the barges by water from pipe yards and laid in a ditch 4 ft deep in the bottom of the canal.



PIPE for the line goes first to a yard where it is coated with 2½ in. of concrete, then is delivered by water to the barges.



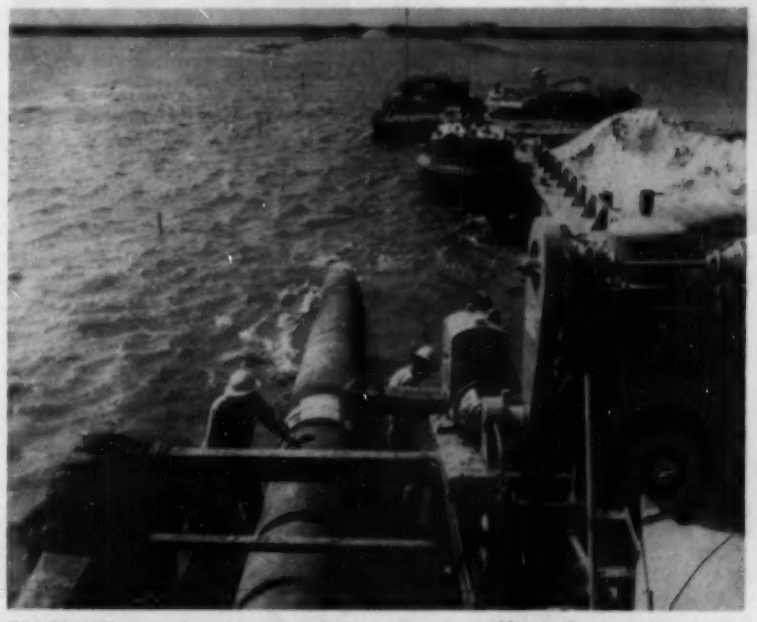
CRANE swings double-jointed section of 24-in. pipe onto launching rollers aboard Williams Brothers Co. pipe-laying barge.

At several points the pipe must be sunk to much greater depths—100 ft at the Mississippi River crossing, 80 ft at Pass A'Loutre, 60 ft at the Atchafalaya River, and 52 ft at the Wax Lake outlet channel. Crossing widths range from just a few feet up to 7½ mi at Lake Raccourci.

The first 70 mi of the pipeline involve normal dry land construction techniques. Grayco Constructors, Inc., and Houston Contracting Co. hold contracts for this portion.

The underwater portion—approximately 285 mi of pipeline ranging in diameter from 24 in. to 4 in.—is being built by Williams Brothers Company, Houston Contracting Company, Associated Pipe Line Contractors, Inc., and Collins Construction Company.

The line is believed to be the most extensive submarine gas pipeline in existence. Construction began early in March, and completion is scheduled for mid-summer.



CROSSINGS range from just a few feet to as much as 7½ mi. The line will cross 130 navigable bodies of water, including the Mississippi River where it must be sunk 100 ft.

Pretensioned Piles Are 132 ft Long

PILE DRIVING RIG picks 132-ft pretensioned pile from barge with two 60-ft cable slings attached to running blocks on picking lines. Separate winches power each line.

By L. L. WISE
Associate Editor

A SPECTACULAR pier modernization job on the San Francisco waterfront involves casting and placing pretensioned piles 132 ft long, among the longest on record.

Ben C. Gerwick, Inc, holds the $1.4 million contract from the California State Board of Harbor Commissioners to fill in a 190-ft slip between two 800-ft piers with a pile-supported platform. The platform will provide additional working space to service ships.

The job requires more than 2,000 piles of which 139 are the long pretensioned piles. The rest are composite piles with timber tips up to 104 ft long and pretensioned butts from 23 to 35 ft long.

The long piles have a 20-in. octagonal section and include 18 Roebling pretensioning strands of ⅜-in. nominal dia. To conserve weight, cardboard Sonovoids form an 11-in. hollow core except in the 4 ft at the tip and the 4½ ft at the butt of the piles.

The pretensioned sections of the composite piles have 14-in. octagonal sections and include 11 Roebling tensioning strands of ⅜ in. nominal dia. The bottoms of the sections are cast into 13-in. ID pipe sections 4 ft long which splice the wood and concrete.

Gerwick casts the piles in a 500-ft long pretensioning bed at the firm's Petaluma, Calif., yard. Specifications require the concrete to reach a 28-day strength of 5,000 psi. And strength has to be 4,000 psi before the piles can be handled. To permit as early handling as possible, Gerwick uses an 8-sack mix of a modified high early strength cement—Permanente Pronto—and gives the piles a 24-hr steam cure. In several instances, piles have been cast, hauled to the job, and driven in less than a week's time.

Design of the project calls for the slip between the two piers to be filled with stiff mud to an elevation of 6 ft below low water level—leaving the water just deep enough to permit a floating pile-driving rig to operate. Composite piles go into this area. The concrete sections of the piles extend 10 ft into the mud so that the timber sections are well protected from the action of marine organisms.

A rock dike, dumped near the pier head line, holds the mud fill in place. Engineers feared timber piles would not penetrate the rock fill so they specified the long pretensioned concrete piles for this section.

Alternate bids were taken for both types of piling. The composite piles proved cheaper than full-length precast piles or than gunite-jacketed timber piles. And the long pretensioned piles cost slightly less than the heavily reinforced concrete pile alternate.

Design and construction supervision of the project is under the direction of S. S. Gorman, chief engineer of the California State Board of Harbor Commissioners. John Ford is job superintendent for the contractor, and Jack Weiss is in charge of Gerwick's Petaluma yard.

(Continued on page 75)

A Cat D315 Engine powers this ditcher working on a Houston residential development. Other Caterpillar equipment on this job includes six D8s, one D7, one D6 and two Scrapers.

Standardizing on rugged yellow equipment pays off two ways: (1) Big production at low cost and (2) fast, capable "one-stop" service from your Caterpillar Dealer.

WORKING IN TOUGH TEXAS GUMBO

F & C Equipment Co., Inc., Houston, specified a CAT® D315 Engine for this ditcher. Result: profitable production.

Digging a sewer line in Sharpstown, world's largest residential development near Houston, Texas, this Parsons Trenchliner worked 10 hours a day, 6 days a week. The F & C Equipment Co., Inc., which relies heavily on Caterpillar equipment, specified a Cat D315 Engine as original power. Field superintendent G. M. Strickler reports: "This is a big job and it takes the best equipment. We have to have something to produce with—and we find that Caterpillar units are the best so far!"

There's a reason they're "best so far!" Combining research with practical experience in the field, Caterpillar constantly improves its products to offer you the most modern equipment. Take its new line of heavy-duty engines, for instance. These rugged units are built to outwork comparable size engines of other makes. They pack more working power. They're sturdily built with such details as complete filter protection, bearings made of a special aluminum alloy, cylinder liners "Hi-Electro" hardened and chrome-faced piston rings. They use low-cost fuel without fouling. As a result, whether you use them in a ditcher, excavator or any other type of construction machinery, you can depend on them for big production at minimum cost.

Leading manufacturers of construction machinery are supplying Cat Diesels as original power. Or your Caterpillar Dealer is ready to install them as replacement power. A full line is available, capable of producing up to 650 HP (maximum output capacity). See your Caterpillar Dealer for details about these modern heavy-duty diesels!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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MODERN HEAVY-DUTY CONSTRUCTION POWER

ANNOUNCING

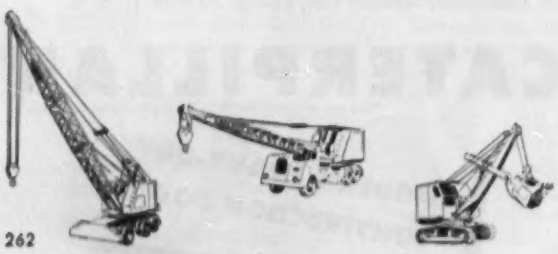
THE NEW MODEL 600

BAY CITY 25 TON CRAWLER

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES
DRAGLINES • CLAMSHELLS



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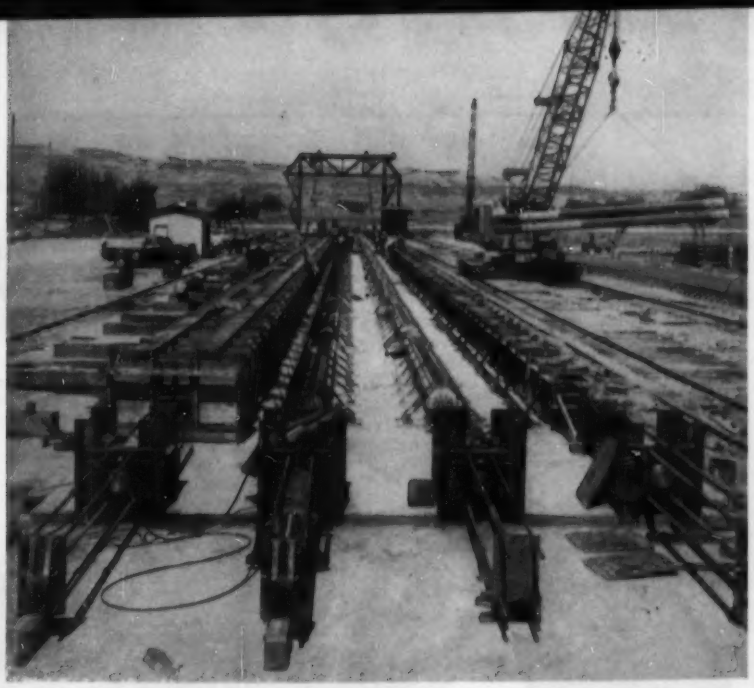
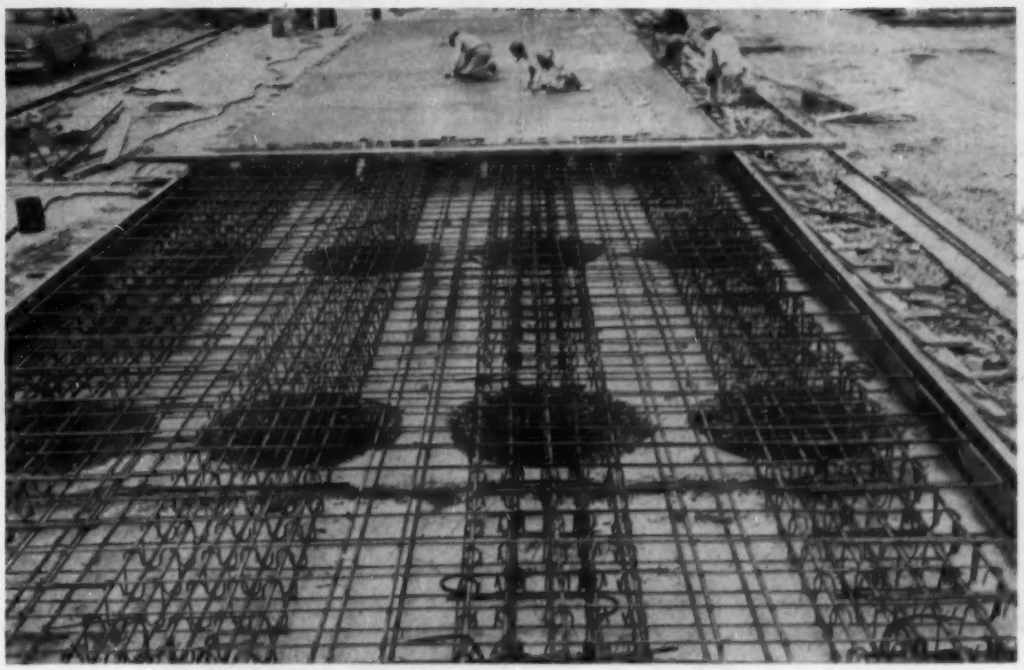
Shown here working with a clamshell on a 55 foot boom, the new BAY CITY 25 Ton Crawler is a versatile erectors' crane that does many jobs with ease . . . it is a beautifully balanced crane with plenty of power for you. The new BAY CITY has load ratings ranging from 50,000 lbs. at ten foot radius with a 30 foot boom to 1,650 lbs. at 70 foot radius with a 100 foot boom. Its independent worm boom hoist raises and lowers boom and load only under power through separate friction clutches. A special load-lowering mechanism is available for precision lowering of heavy loads. Telescopic boom backstops and hi-collapsible gantry are standard. For handling maximum loads the three sheave boom point and load block can be used with 2, 4, or 6 part lines. As a crane with 30" shoes and standard equipment, it weighs 58,000 pounds. For further details on the new 25 Ton BAY CITY Crawler, write for Bulletin 600 A.

PRETENSIONED PILES . . .

Continued from page 72



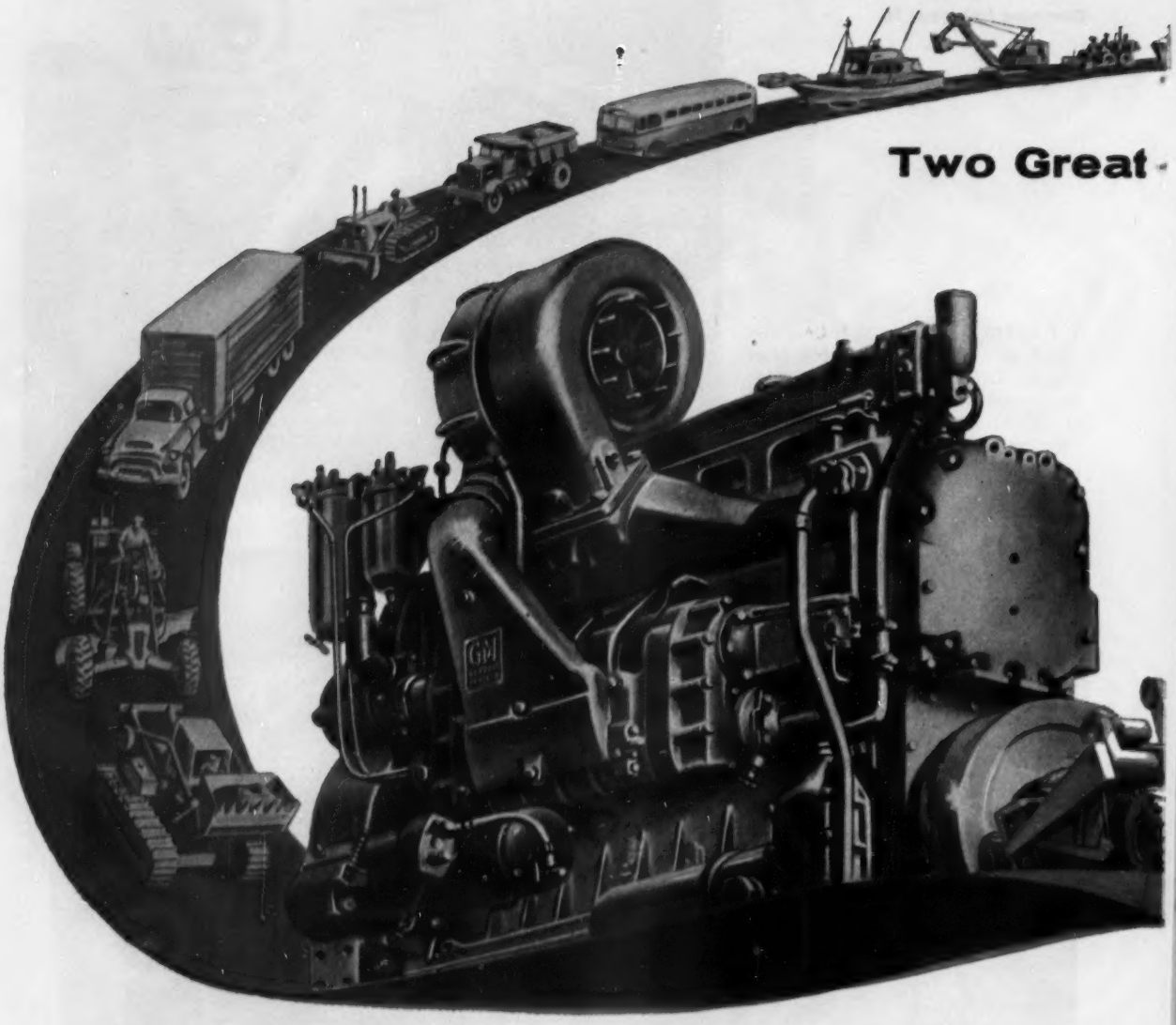
1. CASTING BED is 500 ft long and has four casting lines. Heavy steel H-piles driven into the bed provide abutments for pretensioning operations. An Osgood locomotive crane services the casting bed.



2. CONCRETE SLAB 12 in. thick and heavily reinforced forms casting bed. To prevent settlement, bed is supported on piles. Screw inserts help obtain parabolic curve of strands on pretensioned beams.

3. PRETENSIONING STRANDS are threaded into holder so that all can be winched down casting bed at once. Numbers on wood jig in background correspond to reels of cables.

(Continued on page 78)



Increased Power—Decreased Fuel

Here's exciting news for power users—great new 4- and 6-cylinder GM Detroit Diesel engines that represent another long forward step by the leader in the Diesel engine field. With this new, more efficient Detroit Diesel Turbopower you can have up to 17% more power with no increase in fuel consumption—or the same power output with fuel saving up to 15%.

Detroit Diesel engineers have Turbocharged 2-cycle Diesels by combining an exhaust-driven turbine with the engine blower to deliver a larger supply of fresh air to the cylinders. Result: improved combustion, freer engine breathing, quieter and more efficient performance in the higher speed ranges.

Turbopower Diesels are additions to Detroit Diesel's time-proved Series 71 line, world's most widely used Diesel engines. The four-cylinder Turbopower Diesel delivers 171 H.P. at 2300 R.P.M.; the six-cylinder engine produces 280 H.P. at 2300 R.P.M.

To truckers Turbopower means speedier, more economical movement of big payloads.

To boatmen it means faster speed or longer cruising range—more room for cargo.

To contractors and other industrial users it means greater work output from higher-powered engines or improved economy.

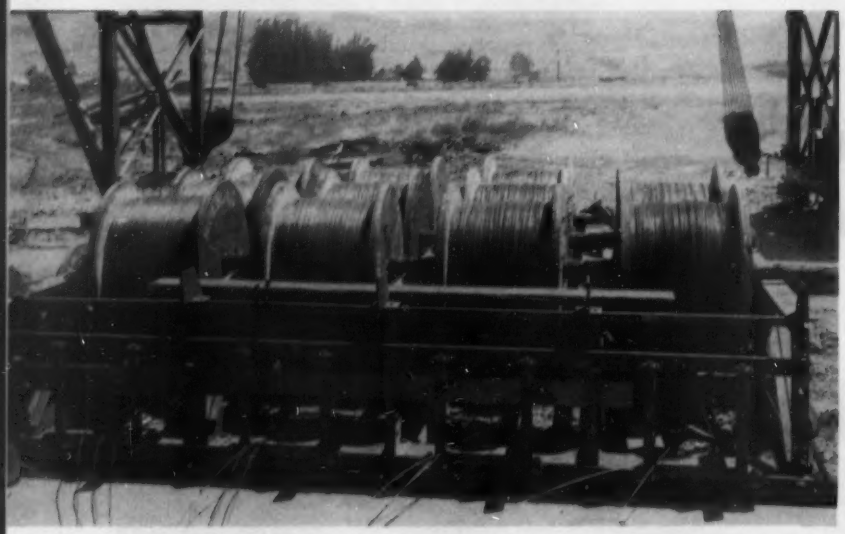
For the full story of 2-cycle Turbopower, write us or call your nearest GM Detroit Diesel Distributor or Dealer.

AMERICA'S LARGEST BUILDER OF DIESEL ENGINES

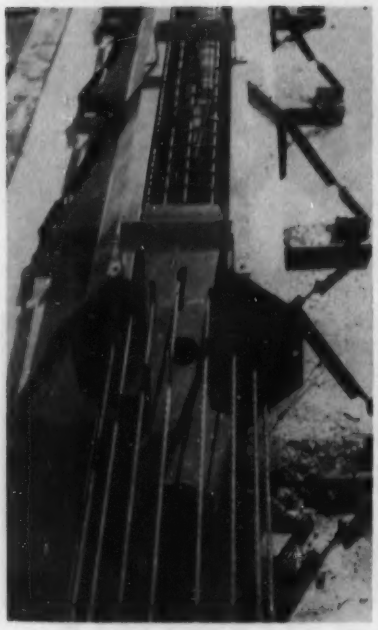
New Engines Added

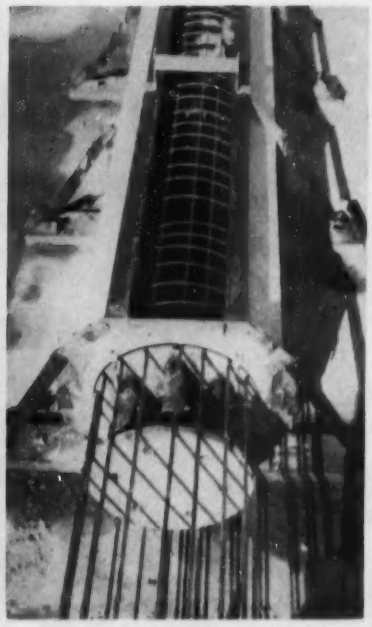
to General Motors 2-cycle Diesel Line

Detroit Diesel Turbopower



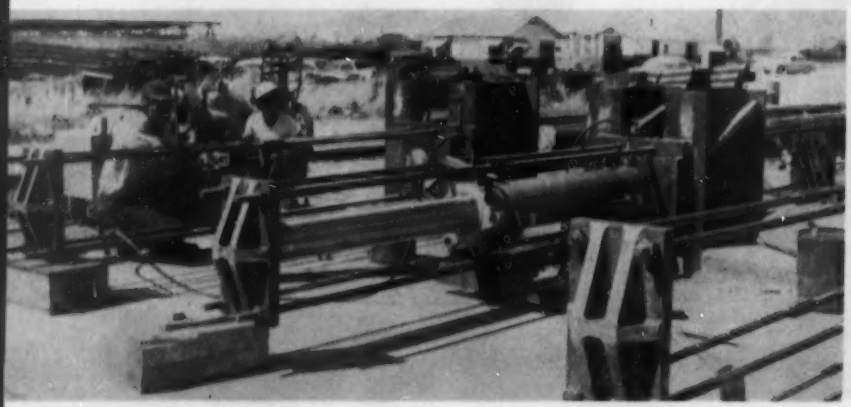
4. CABLE REELS are mounted on a frame so that all strands can be threaded at one time. For the large piles, seven additional reels are mounted to provide the 18 strands needed. Shorter composite piles require only 11 strands.





5. STEEL TIP of pile has slots through which pretensioning strands are threaded. Steel forms for the piles were made to order for the job. Each of the four lines in the casting bed can accommodate three of the 132-ft piles at one time.

6. PILE BUTT includes insert holes so dowels can be positioned after the pile is driven. Long piles have 20-in. octagonal sections with 11-in. hollow cores formed by cardboard Sonovoids except for about 4 ft at the tips and 4½ ft at the butts.

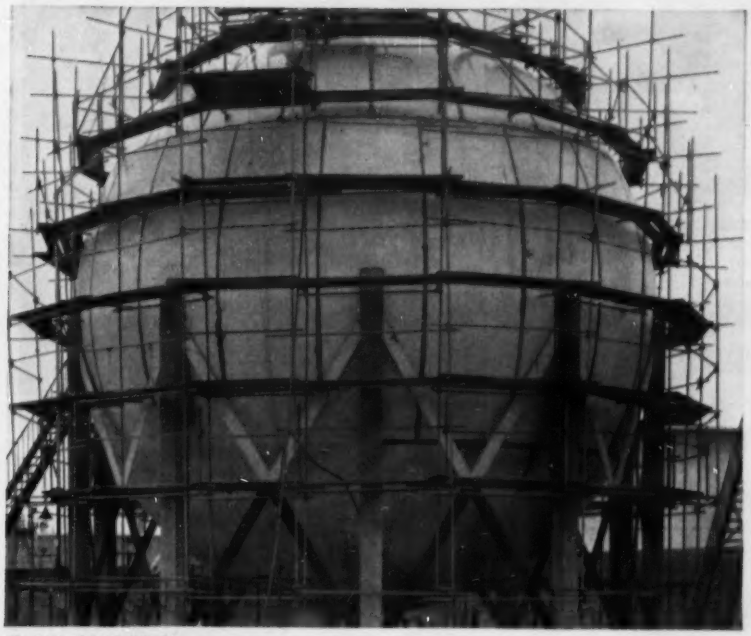


7. PRETENSIONING JACK is a 200-ton capacity Rogers hydraulic unit. Jack works against heavy steel H-piles driven into the bed. All strands are stressed at one time. Jack can be removed and used elsewhere while concreting is under way.

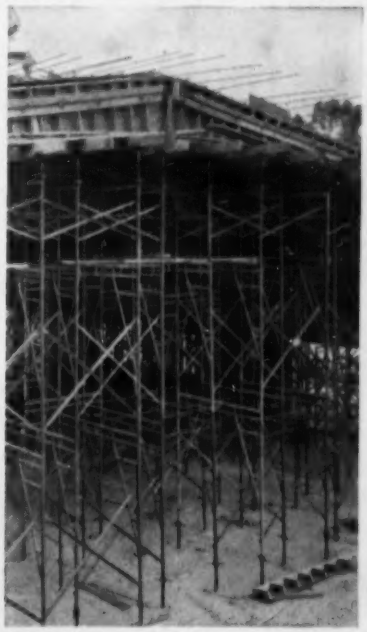
(Continued on page 80)

(Advertisement)

Scaffolding Methods . . . by Patent Scaffolding Co.

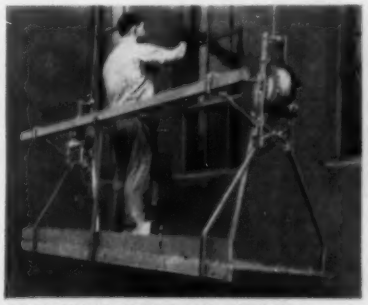


ODD SHAPES—The ability to conform to odd shapes, curved forms, uneven terrain and surfaces makes "TubeLox"® Scaffolding valuable on difficult, hard-to-get-at jobs. Interlocking 2" or 2½" o.d. steel tubes and couplers speeded erection and dismantling of the scaffold for maintenance work on this Union Oil Co. sphere at Wilmington, Calif. Notice how the "TubeLox" Scaffolding is set back to conform exactly to the shape of the sphere permitting workers to get closer to the job.



HEAVY LOAD—"Trouble Saver" Sectional Shoring frames, on 2' 6" centers, speed work on Mess Hall, Marine Corps Base, El Toro, Calif. Heavy, high-arched 62' beam varied from 2' 2" to 3' 6" deep by 1' 6" wide. Allison Honer Co., gen. contr.

SMART ENGINEERING—Accurate positioning of prefabricated "Trouble Saver"® Sectional Scaffolding saves time and money on construction of four pier columns for one of 5 overpasses leading to a lower section of the New York State Thruway. Scaffolding supports vibrating machine and workers, and helped in erection of formwork for above-ground sections of pier shells. Carlo Bianchi, contractor.



MEDIUM-DUTY REPAIRS—Exterior work, such as painting or repairs is quickly done with the "Gold Medal"® Junior Scaffold. Mechanical winch with 5/16" steel cable (100 to 200 ft. drops) assures maximum safety. U.L. approved.

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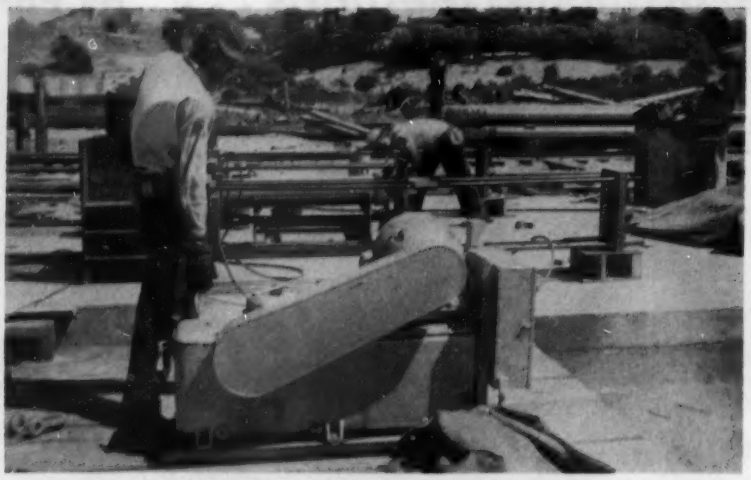
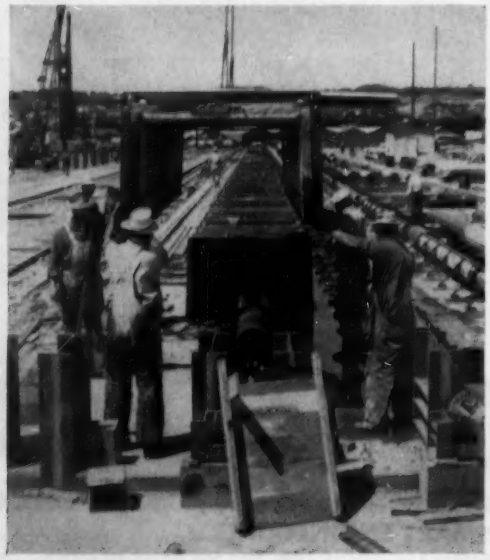


8. HYDRAULIC PUMP at one side of the casting bed develops hydraulic pressure for the pretensioning jack. It is electrically powered. One jack and pump team can handle all four of the casting lines.

9. CONCRETE is poured into the forms from ¾-yd Gar-Bro bucket. Wood hopper makes bucket handling easy. Internal vibration by a Viber vibrator distributes concrete.



10. STEAM HOODS lined with aluminum for heat reflection cover one casting line. Steam cure of 24 hr permits form stripping. After an additional 16-hr air cure, piles are up to 4,000 psi and can be moved.

(Continued on page 83)

New DW21 makes 15 round trips per hour on 1200-foot round-trip haul in Montana

On Tenth Avenue, South, in Great Falls, S. Birch & Sons Construction Co. is rebuilding four miles of by-pass connecting U. S. Highways 87, 89 and 91. The $454,000 contract calls for widening the route from two lanes to four lanes, divided. Completion of the one-year project is scheduled for August, 1956.

A CAT* DW21 Tractor (Series C) with a No. 470 LOWBOWL Scraper is shown here loading material from the old road surface. It makes 15 round trips per hour over a haul distance of 200 yards each way. The rig has done 90% of the earthmoving on this job, according to C. F. Graves, foreman. He says: "It's the best piece of rubber-tired equipment I ever saw. It does a good job of ripping up the old oil surface, and in dirt it can do a pretty good job of loading itself."

Guy Haney, the superintendent, adds: "Our new DW21 is a honey. It has fine power and traction and the No. 470 definitely loads much easier than any other scraper we ever used."

Wherever these new units are in action, that's the kind of reports that come in. The DW21 (Series C), with its 300 HP (maximum output) Turbocharged engine, is perfectly matched with the No. 470 LOW-BOWL Scraper. The lower, wider bowl design loads more earth faster and with less effort. That means consistently better cycle times and bigger production.

If you haven't seen the DW21-No. 470 unit at work, ask your Caterpillar Dealer for a demonstration right on your job. Hold a stop watch on it and prove for yourself that it will outwork any comparable wheeled rig.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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"...started with a rented CLEVELAND in 1949 ...now we own ten"

SO SAYS HUBERT S. ELEY, vice president and general superintendent of D. A. Foster Trenching Corp., of Merrifield, Va. Today the firm, employing about 200 men in the field, keeps its 10 Clevelands (Models 95, 110 and 140), constantly busy on trenching jobs of all kinds. Further excerpts from Mr. Eley's report:

"...we encounter all types of soils and terrain ... swamps, sand, rock, shale, clay ... stumps, boulders and other obstructions ... hill and flatland ... our Clevelands dig them all."

♦

"...we dig a gas or water house-connection in 15-20 minutes with one of our Clevelands."

♦

"...on building footings we dig 1,800-2,000 feet of 30" deep trench per day with a Cleveland."

♦

"...not necessary to stockpile large amounts of parts for Clevelands."

♦

"...fuel costs not a significant factor ... our Clevelands operate a working week on a tank of fuel."

♦

"...our Cleveland 140 paid for itself within 30 days."

♦

"...one of the many reasons we prefer Clevelands is their all-around adaptability ... besides our utilities work and footings contracts we use them for drainage trenching, septic tank installations and a wide range of other applications."

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"...we consider Clevelands the best all-purpose trenchers made ... the easiest to operate ... and the longest lasting."

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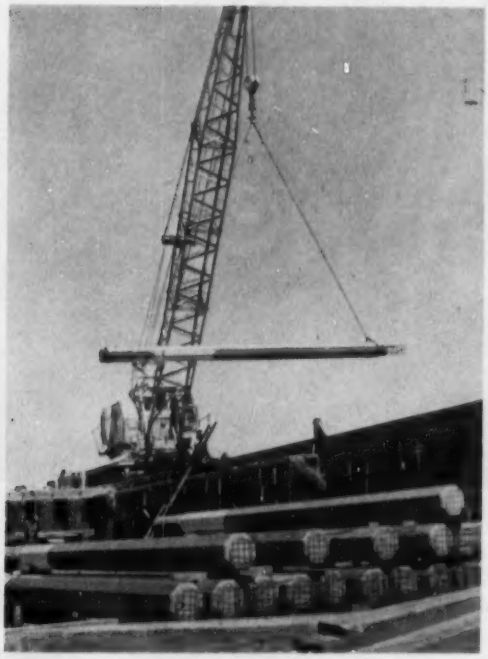
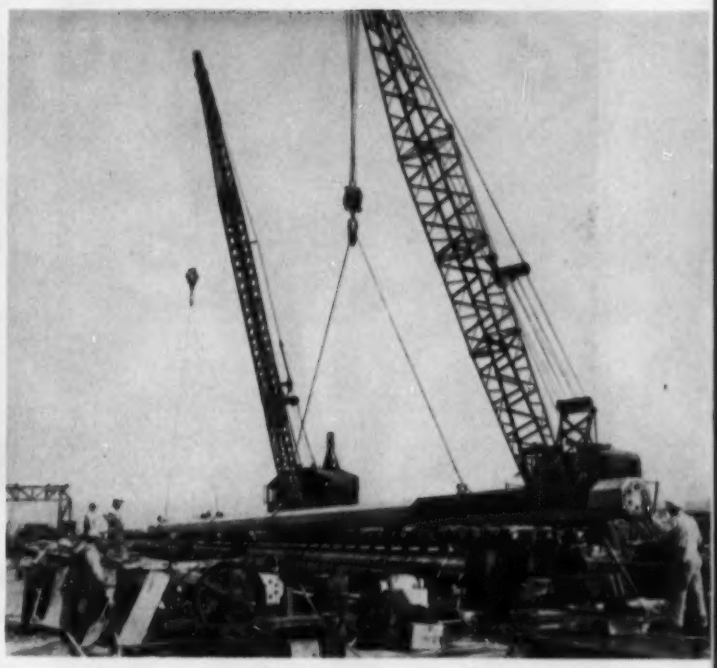
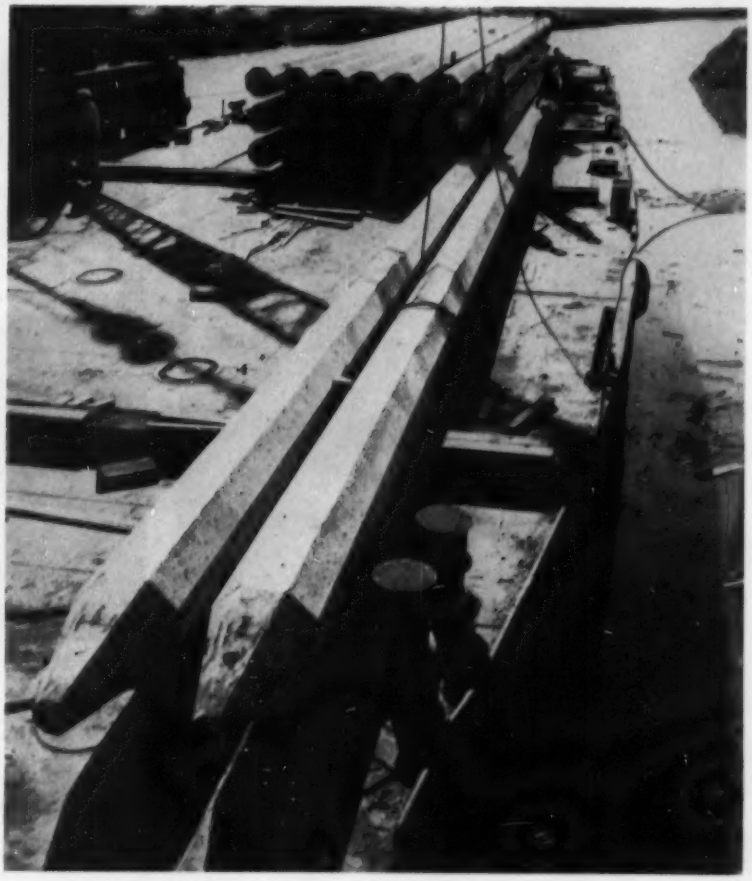




11. CRANE lifts short pretensioned section of composite pile for loading onto barge. Pretensioning strands extend from top of pile, and at other end there is a 13-in. ID section for splicing with timber pile.

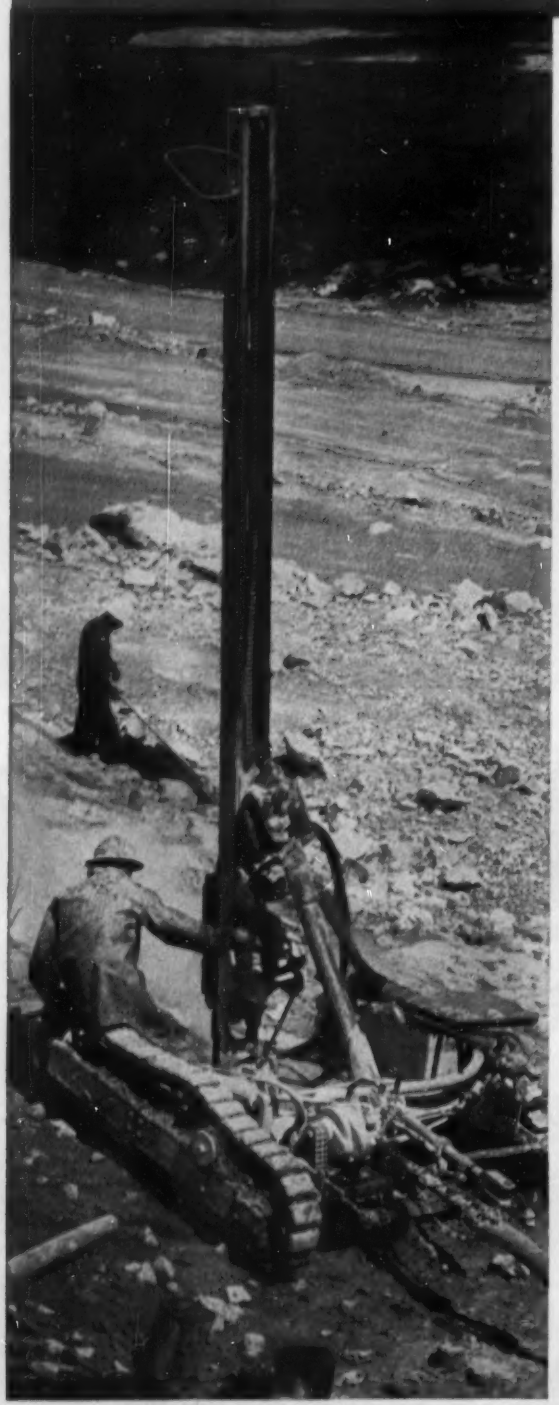


12. TWO CRANES carefully lift 132-ft pretensioned pile from casting bed. Four-point suspension helps prevent damage to the pile. Without pretensioning, a six-point pickup would have been necessary.

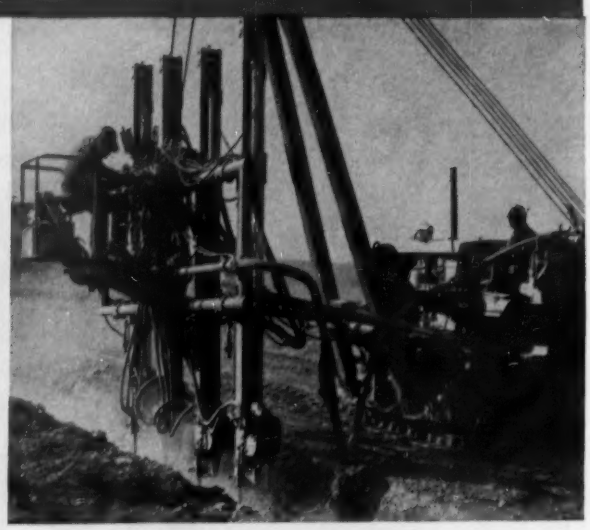
13. BARGE carries piles 50 miles to job site. It can handle up to 30 long piles and as many as 100 composite pile sections in a single load. Location of casting yard on tidal slough facilitates handling.

(Continued on page 86)

Gardner-Denver...



Self-propelled "Air Trac"® drill for rough terrain.



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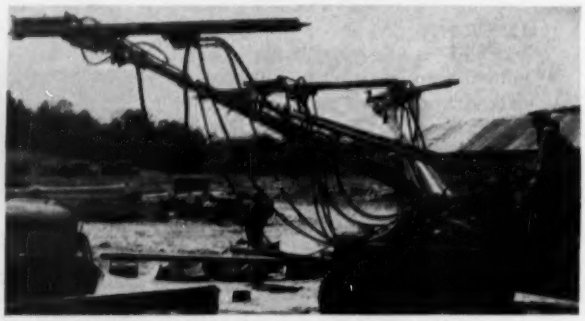

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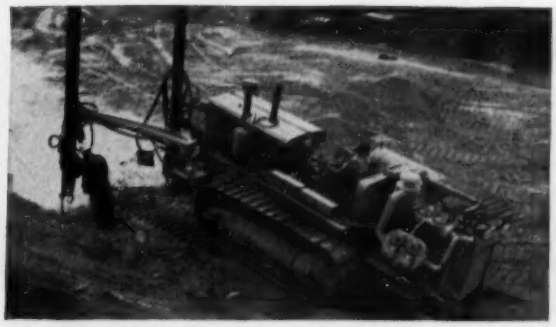
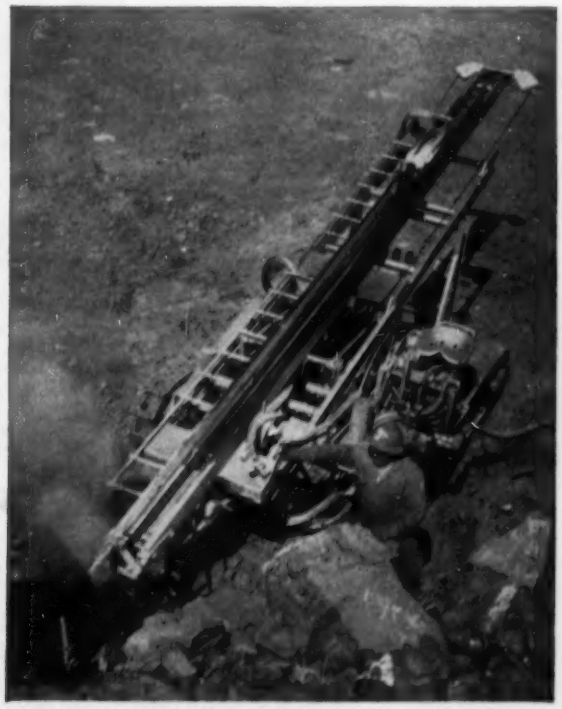


Tractor-mounted drills with hydraulic booms, and compressor.

Long-feed tunnel drills and hydraulic booms.



New 5½" heavy-duty rock drill on self-propelled crawler.

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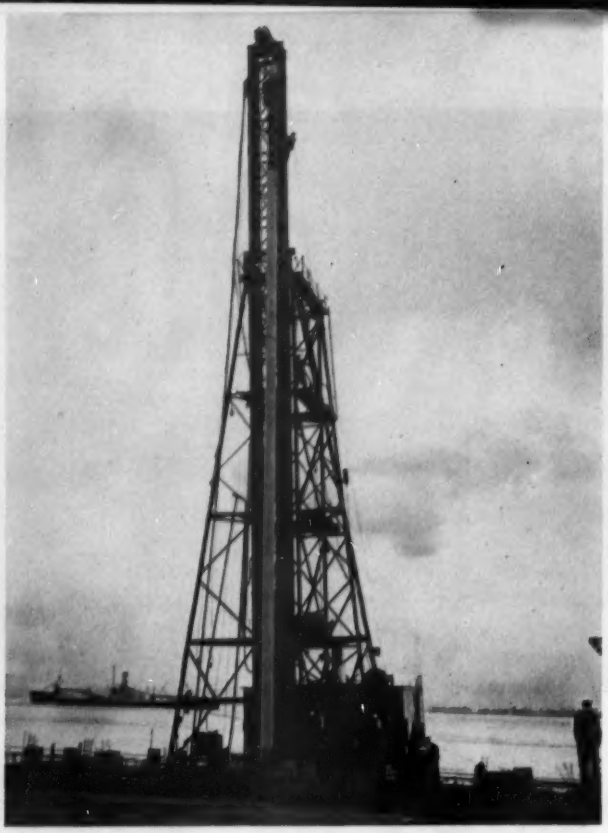
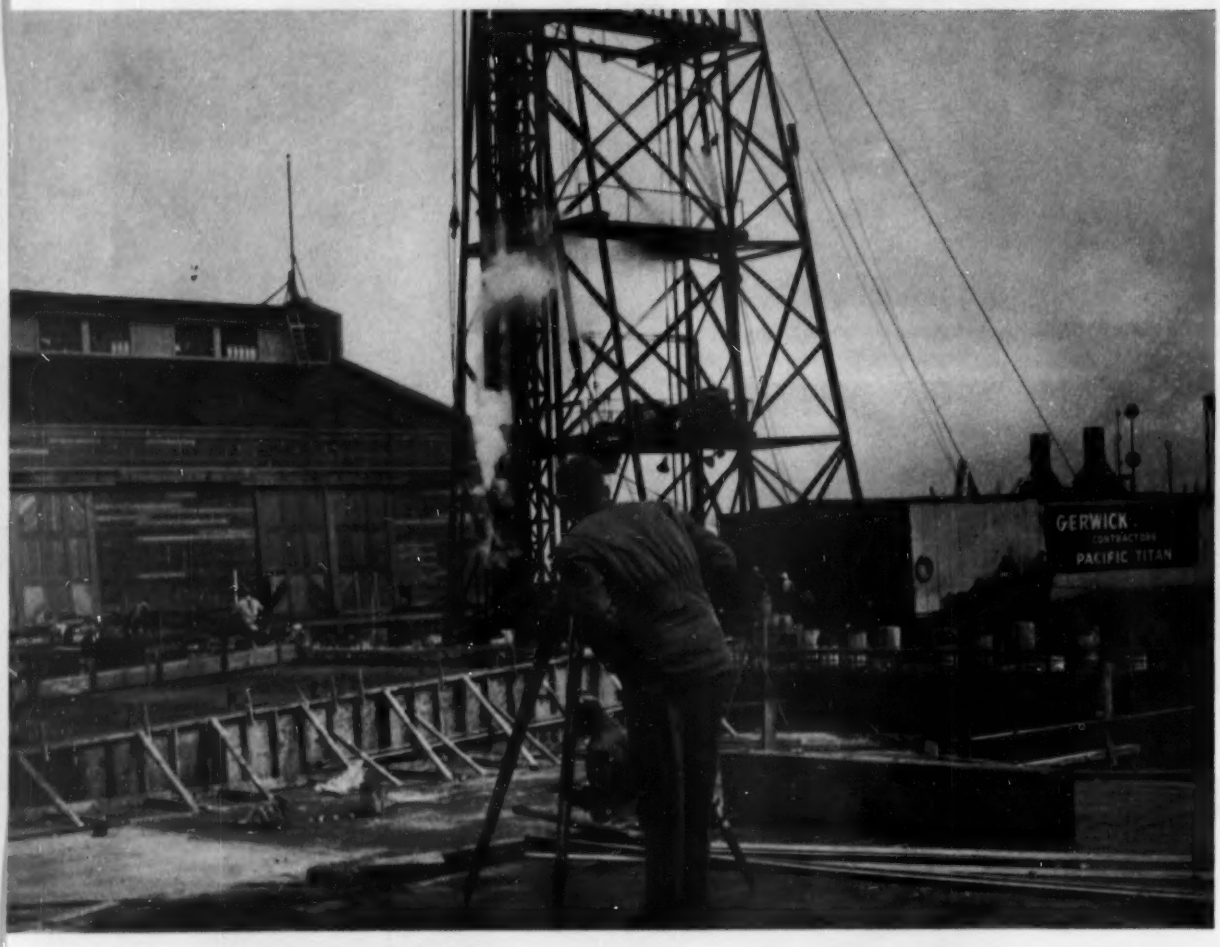
PRETENSIONED PILES . . .

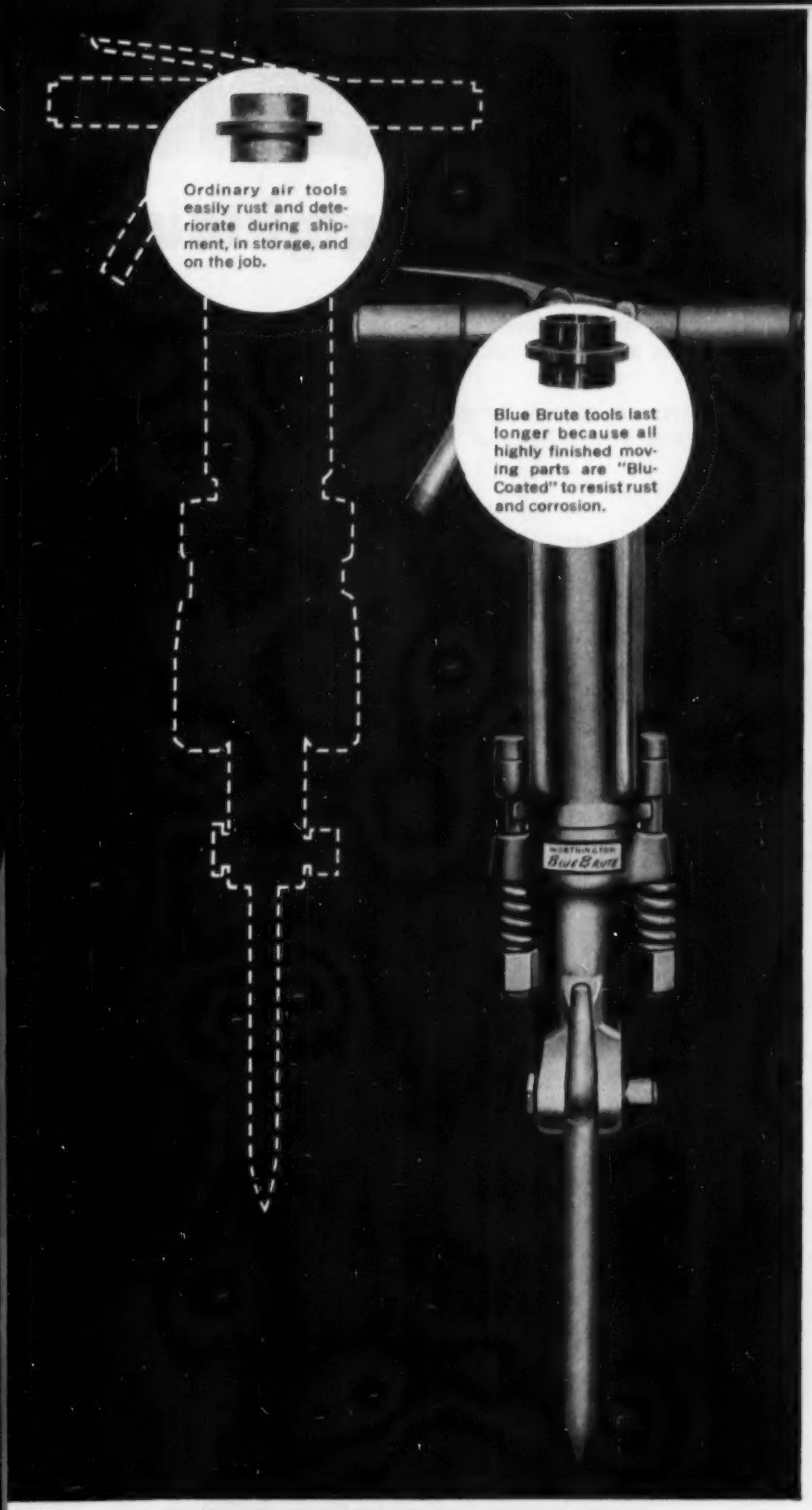
Continued from page 83



14. FLOATING RIG threads long pile into 120-ft leads capable of driving 80 ft below water level and on a 3 on 12 batter. Two 150-hp steam boilers supply power. Rig is maneuvered by anchor lines.

15. LONG PILE is driven with a McKiernan-Terry S10 hammer. Driving rate is 5 to 9 piles per 8-hr shift. Vulcan 50C hammer drives composite piles. All piles are driven to predetermined elevations.




Ordinary air tools easily rust and deteriorate during shipment, in storage, and on the job.
Blue Brute tools last longer because all highly finished moving parts are "Blu-Coated" to resist rust and corrosion.

How BLUE BRUTE air tools fight off rust and corrosion

Blue Brute tools are now "Blu-Coated" to help them resist rust and corrosion.

An oxidizing process applied to all highly finished moving parts, "Blu-Coated" penetrates the metal skin, absorbs and holds oil in the pores. This built-in lubrication helps a Blue Brute tool outperform all others under rugged operating conditions.

Protection against dry starts. If you forget that extra shot of oil to protect a Blue Brute tool during the critical few seconds until the regular lubrication system starts to function, you needn't worry. The Blue Brute's built-in oil supply protects it against excessive wear, seizing, and galling.

Protection against moisture. On a humid day, condensate in the air line can play havoc with an ordinary air tool. Not a Blue Brute, however. The metal pores retain their oil, won't let water vapor wash it out and damage the tool.

Protection during storage. When you finish a job, you can store your Blue Brute tools for months without deterioration. "Blu-Coated" parts are practically immune to rust and corrosion.

For better performance and longer life, make sure your next air tool is a "Blu-Coated" Blue Brute. They're available at no extra cost from your nearest Worthington distributor. Worthington Corporation, Harrison, N. J.

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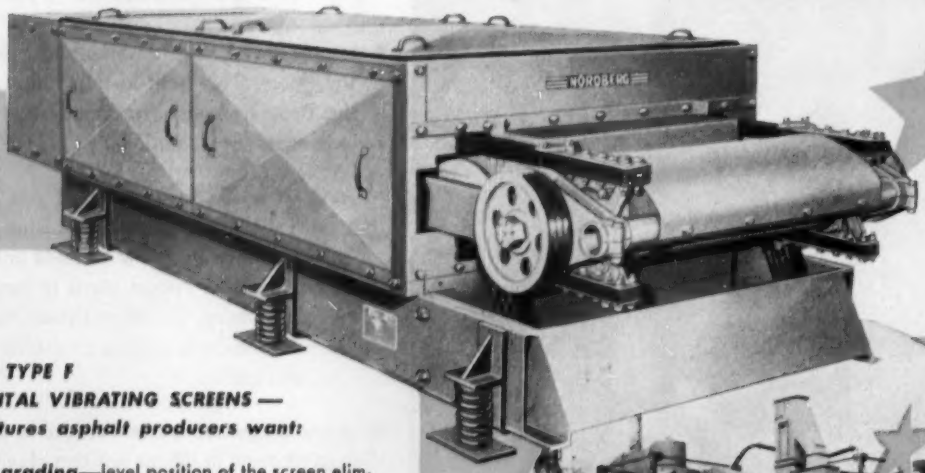
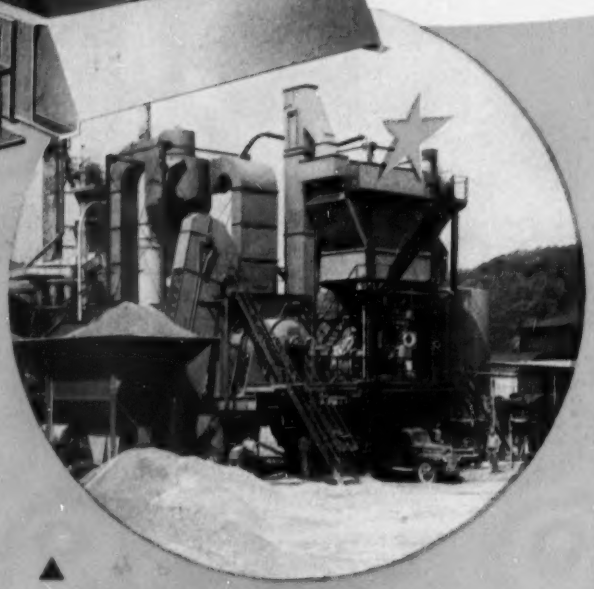
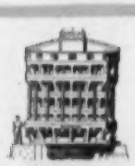


SYMONS TYPE F HORIZONTAL VIBRATING SCREENS — Features asphalt producers want:

- ***Better grading***—level position of the screen eliminates bouncing and cascading of material along deck and leaves the full opening of the mesh available for screening. Positive action thoroughly agitates material and more quickly stratifies it for closer sizing.
- ***High capacity***—positive vigorous screening and conveying action gives the "F" Screen greater capacity than is possible with inclined type screens.
- ***Adaptability***—installed in a level position with low overhead requirements, the "F" Screen shortens elevators, simplifies construction and reduces overall dimensions of the plant. Being free from vibration, there is no tendency to shake scales or other measuring devices.
- ***Multiple separation***—with multiple decks and many varied screen sizing possibilities, including gap, lower deck, versatility of sizing to meet any specification is possible with the "F" Screen.
- ***Low maintenance***—drive unit with bearings and motor are located outside the screen housing, away from dust and heat.



▲ ***Standard Equipment on SIMPLICITY Plants.*** "We have long standardized on the use of Symons Screens in Simplicity Plants. One big reason is that highway engineers realize that accurate screening means much to the durability of finished asphalt pavements," says Wm. C. West, of The Simplicity System Company.



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SYMONS CONE CRUSHERS

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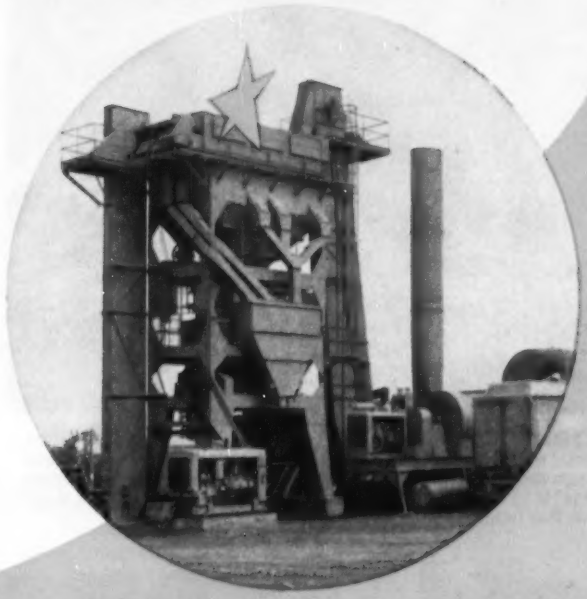

Standard Equipment for MADSEN. Madsen Works has used Symons Screens exclusively (unless otherwise specified by customer) since 1930. Here's why, says W. M. Madsen, V.P., Research & Development:—"Accuracy of sizing with a minimum of carry-over; simple to adjust; easily serviced; rugged, simple, accessible and well designed."

Used Exclusively by WARREN BROTHERS CO. "In the past eight years we have installed close to forty Symons Screens of various sizes. Our satisfaction with their performance must be apparent," says R. C. Paine, Chief Engineer.

Preferred by KOEHRING-WATEROUS, LTD. "We use Symons Screens because they have complete customer acceptance. We like the design which permits the drive unit to be mounted completely outside a dust enclosure over the screen, away from dust and heat," says N. L. Elliott, Manager, Road Equipment Sales Division.

Specified by STANDARD STEEL CORP. "We utilize the Symons Screen on all our plants and find them to be especially suitable due to their ruggedness, high gradation control, and because the operating mechanism is away from the heat," says M. B. Freeman, Manager, Road Machinery Division.

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8256

C&D Movall--Pictorial Proof of Versatility

FEEDS LIMESTONE INTO HOPPER at controlled rate for Cia. Peruna de Cemento Portland, Atacongo, Peru. Operator controls discharge rate from tractor seat, stops ejector when 8-yard crusher is full. Here two 25-yard Movalls, powered by Cat DW20 tractors, replace six 8-yard side-dump trucks.

SPREADS PERVIOUS FILL IN 18" LIFTS at Santa Felicia Dam in California. Movall dumps behind wagon tires, safely at any speed tractor can travel because dozer-type ejector keeps center of gravity low. Depth of spread is uniform, controlled by speed of tractor (4" at 20 mph., 18" at 3 mph.). Movalls also can dump while turning at end of road fill, thus retaining fines on top.

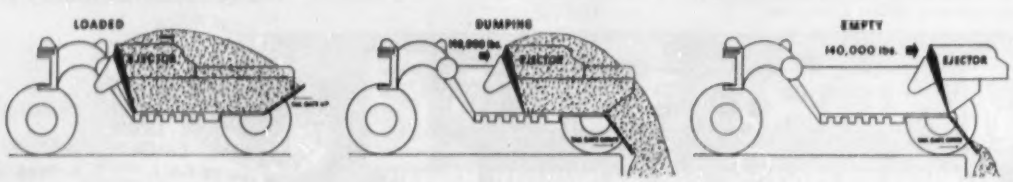
DUMPS OVER EDGE OF FILL with tractor either straight ahead or jackknifed. Drive wheels are always on good footing; center of gravity stays low. Positive ejection with 140,000-lb. push enables Orlando Construction Co., to dump 25-yard load of rock and dirt in 12-14 seconds on Massachusetts Turnpike. Movalls dump cleanly and quickly any material you can top load.

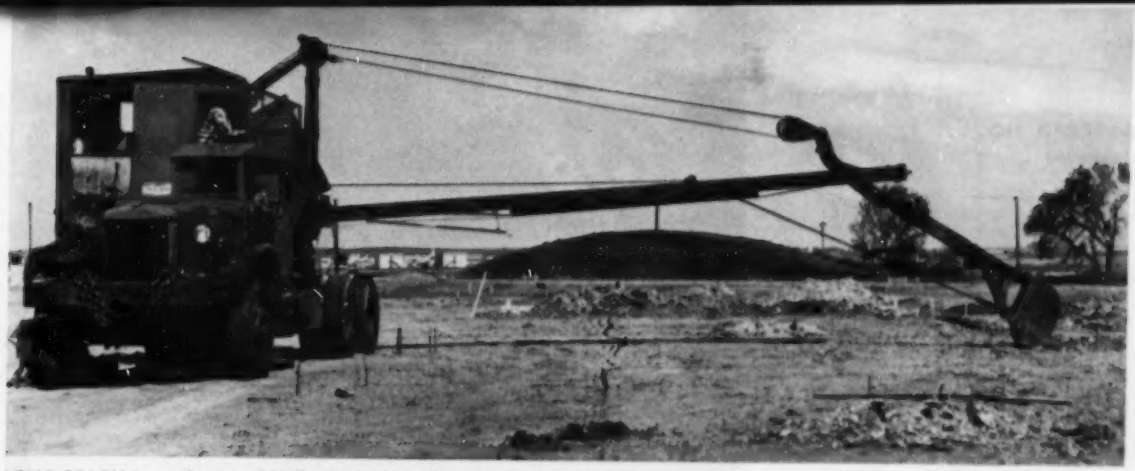
DUMPS ON GRADE safely from any position or on any level. Load is pushed straight back by 140,000-lb. push of dozer-type ejector. There's no raising of load, no danger of wagon tipping or damaging mechanism. Frozen earth and rock being dumped here on St. Lawrence Seaway by C. A. Pitts, Ltd., was loaded by 6-yard shovel.

Movalls are easily interchanged with scrapers. Two sizes: Heaped 25-yd. for DW20 and DW21; heaped 16-yd. for DW15 and DW10 tractors. Interchangeable yokes permit use with various prime movers.

BUY AND TRY—Ask your Caterpillar-C & D dealer for a demonstration NOW, or write C & D Division, Yuba Manufacturing Company, Perkins (suburb of Sacramento), Calif. Phone: GLadstone 5-8592.

HOW IT WORKS





LONG REACH is one feature of Hallender backhoe that can dig 30 ft away from machine. But because movable fitting in boom carries dipper stick, location of shipper shaft can be adjusted for optimum production, depending on digging depth and distance.

Altered Hoe Digs 'On the Money'

BY FITTING his backhoe with what amounts to a variable-length boom, a midwest contractor digging footing trenches for houses has:

- Eliminated more than 90% of finegrading by hand that formerly was required with a standard hoe.
- Reduced concrete overage by at least 25%.
- Cut drastically the number of moves the machine must make to complete a trench.
- Increased accuracy of trench alignment.

Tom Hallender, Lincoln, Neb., contractor, devised the unusual boom. Its effective length can be varied by rolling along it a trolley arrangement that carries the shaft for the dipper stick.

Hallender's hoe conversion is attached to a truck-mounted Quick-Way machine. The boom, 23½ ft long, is made of two parallel 6-in. 25-lb H-beams with webs vertical. Plates ½ in. thick welded between outside flanges make each beam a semi-box section, and the sections are spaced apart by fittings at boom heel and boom tip.

A 9-ft dipper stick extends through the space between main boom members. Its shaft is carried by a trolley section 7-ft long whose wheels ride the inside lower flanges of the boom beams.

A line from the rig's third drum that ordinarily would control the hoe's A-frame, or jack boom, moves the trolley. The line runs from the drum, around a boom-point sheave, and back to the trolley. To free the third drum for this use, Hallender fastened the A-frame permanently

(Continued on next page)

DIPPER STICK extends through double-member boom, where it is pinned to trolly whose wheels ride lower flanges. Line from machine's third drum controls trolly movement.

TROLLY UNIT is moved back toward machine so truck does not need to be repositioned as trench lengthens. On this job, rig digs trench 30 ft long 3 ft deep without moving.

ALTERED HOE...
Continued

vertical by welding straps to the gantry.

Hallender's machine is currently digging shallow footing trenches for government housing at Lincoln Air Force Base. Some 185 duplex houses and 30 single dwellings are being built there by J. W. Bateson Co., Inc., Dallas, Tex. Here's how the converted hoe digs the average 375 lin ft of footing that each building requires:

The rig first is spotted transversely at the end of a footing site. With boom and dipper stick extended, the bucket is placed accurately between string lines that delineate the trench. The hoe operator lowers two aluminum plumb bobs attached near the heel of the boom, and the driver moves the carrier truck until the bobs match the string lines.

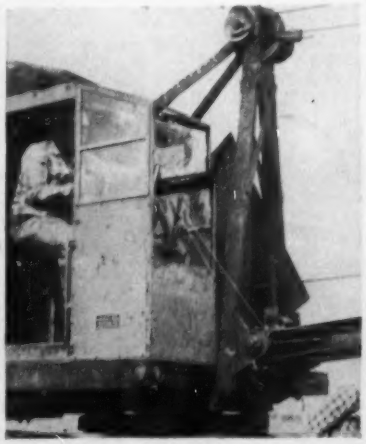
Thus positioned, the machine goes to work. The operator controls it just as he would an ordinary hoe. But when 4 to 5 ft of trench is dug to grade, the trolley carrying the dipper-stick shaft is rolled back toward the machine. After finishing another 4 to 5 ft of trench, the cycle is repeated.

On the Lincoln AFB job, the rig can cover a maximum 30-ft digging range while cutting a 3-ft deep trench. This is sufficient to dig most footings without moving the truck. For longer footings (they range up to 43 ft) the carrier must be repositioned once. Because the machine must be moved only once, if that, while digging a long footing, the trench comes out "right on the money."

In conjunction with his new hoe attachment, Hallender built up a series of buckets of different widths (16, 18, 22, 24, and 28 in.) sized to the footings he is called upon to dig. Instead of teeth, he welded straight planer blades to the bucket to give a smooth cut. Coupled with the extremely accurate trench alignment, this practically eliminates hand trimming and concrete overage.

In addition, Tom Hallender claims his machine has advantages over ordinary hoes on many more jobs than just cutting footing trenches. A regular fixed-length boom must, of necessity, be somewhat of a compromise, he says. A long boom will dig deep, a short one can dig close to the machine. But the variable-length boom can be adjusted easily for maximum output.

PLUMB BOBS attached to heel of boom can be lowered by operator from cab to help align machine. Here they are inspected by Tom Hallender, contractor who designed, built rig.



A-FRAME is held rigid to free the third drum for trolley use.

BUCKET is fitted with sharp planer plates to cut smoothly.

NEAT TRENCH cut by altered backhoe is checked by Ralph Burton (left), hoe operator, and Lester Hansen. This two-man crew alone handles big footing-trench job in Nebraska.

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HORIZONTAL SHORING

helps contractors save time, labor and money

S-L Spanall assembles fast and conveniently to desired span lengths — up to 28 feet 2 inches without need for intermediate supports

—frees work areas on floor below

—adjusts quickly to desired span lengths

—supports 44 times its own weight—with safety factor of 2.17

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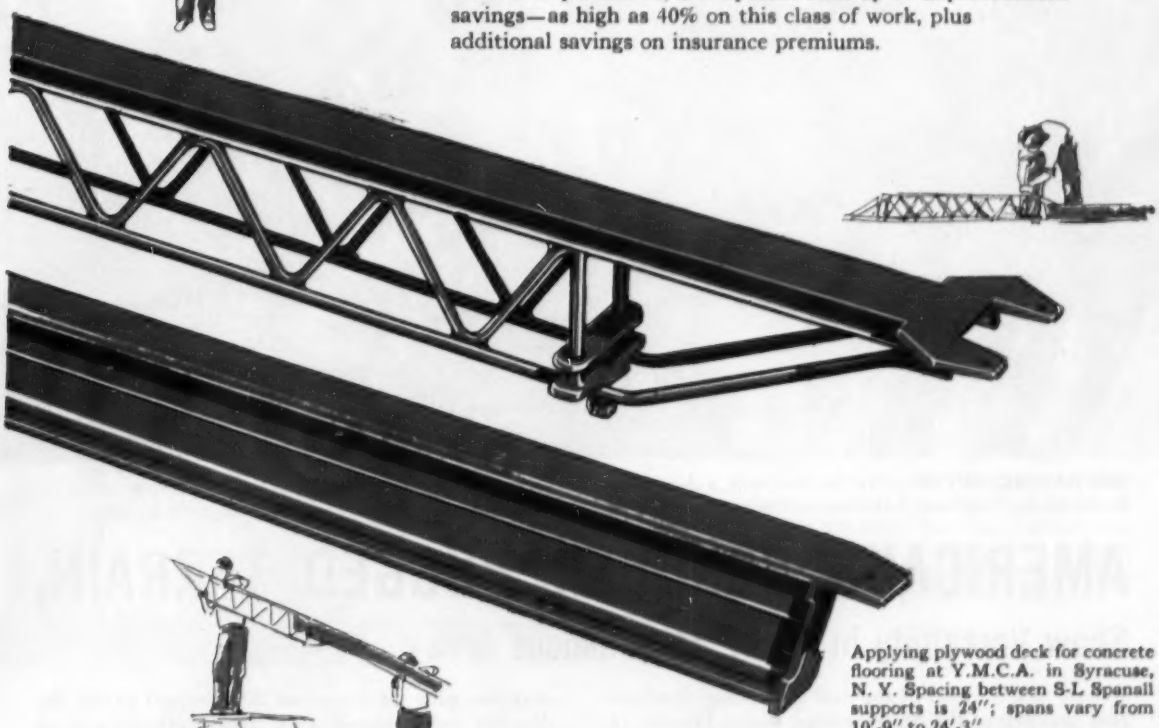
Rented or purchased, S-L Spanall adds up to unprecedented savings—as high as 40% on this class of work, plus additional savings on insurance premiums.



Applying plywood deck for concrete flooring at Y.M.C.A. in Syracuse, N. Y. Spacing between S-L Spanall supports is 24″; spans vary from 10′-9″ to 24′-3″.

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BIG AMERICAN 700 Series Backhoe cuts a deep gash in the rugged Southern California landscape. American's bucket linkage system increases production as much as 20% on jobs like this—an important profit feature!

AMERICANS CONQUER RUGGED TERRAIN,

Show Versatility in Rocky, Mountainous Area!

Recent construction in the ever expanding distribution network of the Metropolitan Water District of Southern California ran through the most rugged terrain yet faced by builders of the vast system! Heavy construction machinery maneuvered through the rocky, mountainous terrain of Southern California to trench, then lay concrete pipe on grades up to 75%! In the Santiago Lateral section—under contract to Baker-Anderson Corp. of Norwalk, California—trenches varied from 11 to 55 feet deep and 7 to 8 feet wide. Baker-Anderson Corp. used two American 700 Series Crawler Cranes—a backhoe and dragline, plus an American 300 Series Crawler for dragline and clamshell work. Heavy 60-inch precast concrete pipe was layed accurately with the 700 Series Cranes!

Tough conditions like these really put Baker-Anderson's Americans to the test! Durability, versatility, performance, control, power, traction—all tried and proved hundreds of times a day! A recent order for a fourth machine confirms this contractor's acceptance of American Cranes. The complete American line starts with ½-yard truck and crawler cranes—your Distributor has all the information!

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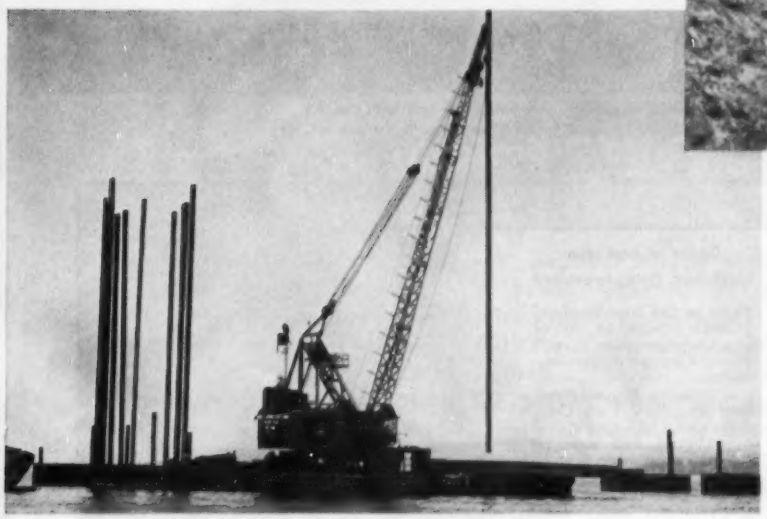
(Advertisement)

AMERICAN 700 SERIES DRAGLINE—one of three Americans used in constructing the Santiago Lateral. Laying the 60-inch concrete pipe was speeded up, yet done with hair-line accuracy because of American's air controls!

"OUR SANTIAGO LATERAL JOB has been a stern test of equipment. American Cranes have proved themselves rugged enough to dig under the most difficult conditions and fast enough to dig profitably. The sensitive controls allow us to lay 60-inch pipe smoothly, accurately and quickly," says H. W. Anderson, president of Baker-Anderson Corp. "My opinion of American Cranes is best shown by our recent purchase of a fourth American Crane", he added!



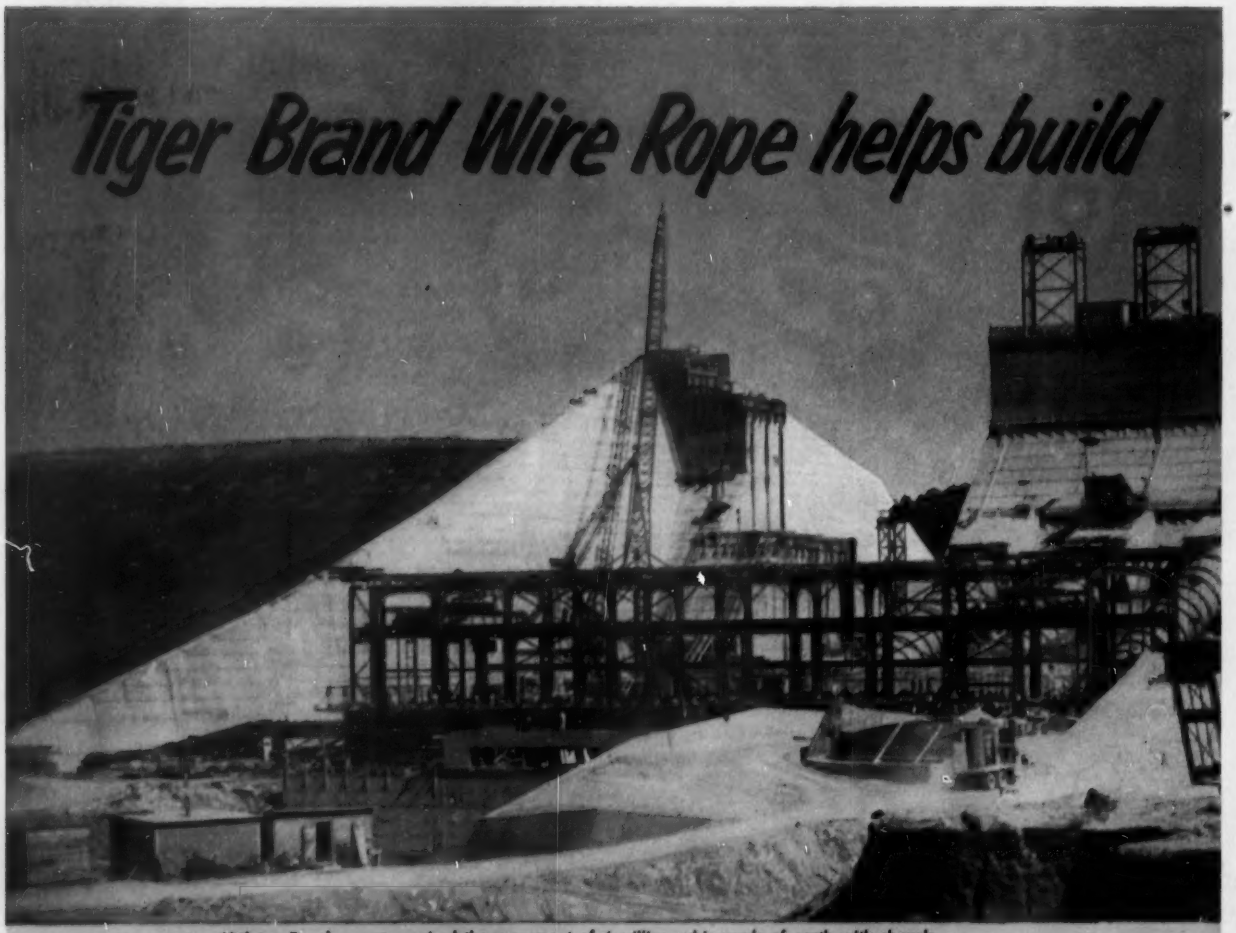
ON THE REALLY BIG JOBS—dam construction, ship building, volume materials handling—you'll find American Revolver Cranes! These powerful, efficient giants have been the standard of the heavy construction industry for years. Designing—building these machines has given American engineers unlimited experience in every phase of crane design—invaluable knowledge that makes American Cranes performance leaders.

Over the past three-quarters of a century, American hoists, derricks and cranes have worked under every possible handicap while doing every type of job. Experience in a world-wide testing ground has given American Hoist engineers the know-how that makes American's complete crane line the best in the world—from every view point!

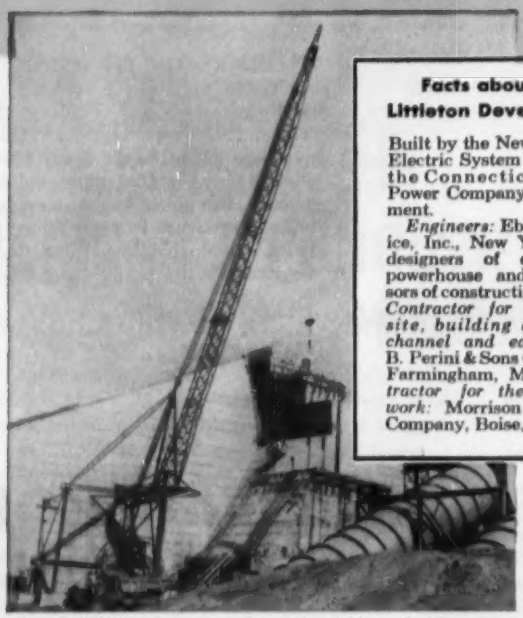
AMERICAN HOIST
and Derrick Company

St. Paul 1, Minnesota

Tiger Brand Wire Rope helps build



Littleton Development required the movement of 4 million cubic yards of earth with shovels and scrapers which used a considerable amount of Tiger Brand Wire Rope in the process.

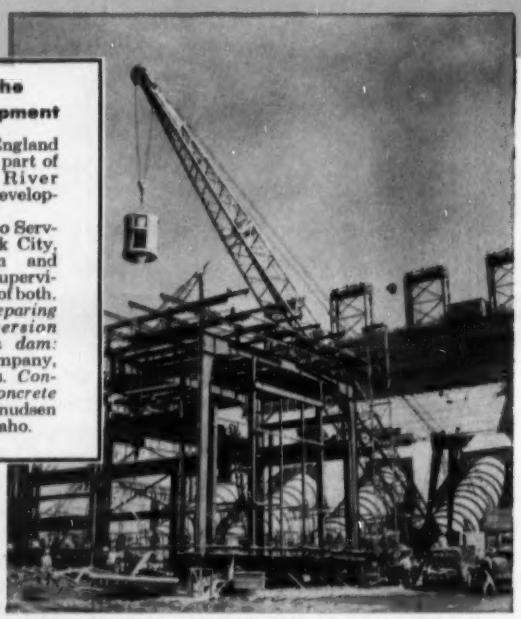


Tiger Brand Wire Rope does the work quickly and at low cost. Hoist ropes are built with the best combination of strength, flexibility and abrasion resistance to assure long life.

Facts about the Littleton Development

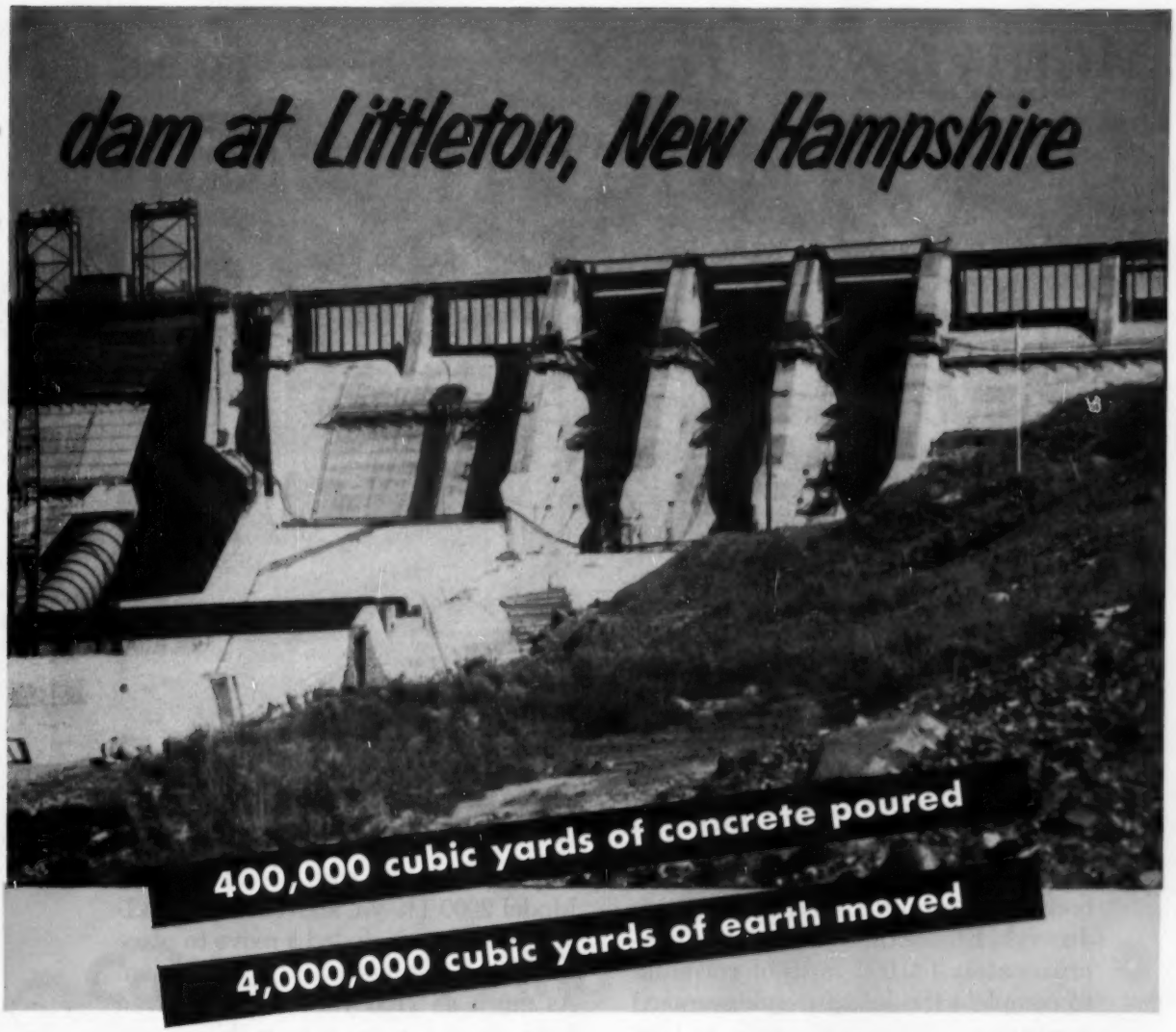
Built by the New England Electric System as part of the Connecticut River Power Company Development.

Engineers: Ebasco Service, Inc., New York City, designers of dam and powerhouse and supervisors of construction of both. *Contractor for preparing site, building diversion channel and earth dam:* B. Perini & Sons Company, Farmingham, Mass. *Contractor for the concrete work:* Morrison-Knudsen Company, Boise, Idaho.



Pouring 400,000 cubic yards of concrete means the crane's hoist ropes take a lot of punishment. Standard Tiger Brand Rope was used in this operation.

dam at Littleton, New Hampshire



The new "Samuel C. Moore Station" of the New England Electric System shares honors with Camerford as the two largest hydro stations in New England.

The rating of the station will be 150,000 kilowatts. The height of the dam is approximately 165 feet. The size of the lake impounded is the largest on the Connecticut River, 11 miles long and covering 3500 acres.

To build this dam, the contractors had to move approximately 4,000,000 cubic yards of earth and pour about 400,000 cubic yards of concrete. The concrete was hauled about a mile to the job in 4-cubic-yard buckets. These were hoisted from the truck to the position on the dam by cranes and the concrete was dumped into the forms.

The contractor for the concrete work was Morrison-Knudsen Company, Boise, Idaho, and the contractor for preparing the site, building diversion channel and earth dam was B. Perini & Sons, Framingham, Mass.

Both contractors used large quantities of American Tiger Brand Wire Rope. It is interesting to note that all the wire rope needs for this job could be supplied from the standard types of Tiger Brand Rope.

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USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

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UNITED STATES STEEL

MANITOWOC faster cycle speed moves more dirt

Leveling ground at a Staten Island borrow pit recently, contractor Peter Juzefyk, Elizabeth, N. J. excavated approximately 100,000 yards of gravel fill to complete the job. Juzefyk averaged 2 minutes – 50 seconds time to load 16-yd. haul units with his Manitowoc Model 2000 1¼-yd. shovel. Total loading time often included a move to place the shovel in a better digging position! As much as 2100 yards was removed from the site in one 9 hour shift.

Why MANITOWOC 2000 does a faster job

FULL USE OF POWER speeds digging. Only 13 gears and pinions make more power available at all times to add horsepower at the dipper (only working gears turn). SMOOTH, DISC-TYPE CLUTCHES speed operation — make control extremely precise. As easily adjustable as automobile-type clutches. SIMPLICITY OF DESIGN and smooth operation greatly add to cycle speed. Sliding pinion arrangement uses just one set of clutches to travel, swing and boom hoist. FAST TRAVEL with extra push for grades up to 30%. Positive steering utilizes either crawler, forward or back. Rugged, simple crawler base has balanced stability needed for digging on uneven terrain. EASILY CONVERTIBLE in the field to crane, dragline and trench hoe operation — whatever front end the job demands.

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On your next bid let Manitowoc speed and power help cinch the deal. Contact your helpful Manitowoc distributor for the full, profitable story.

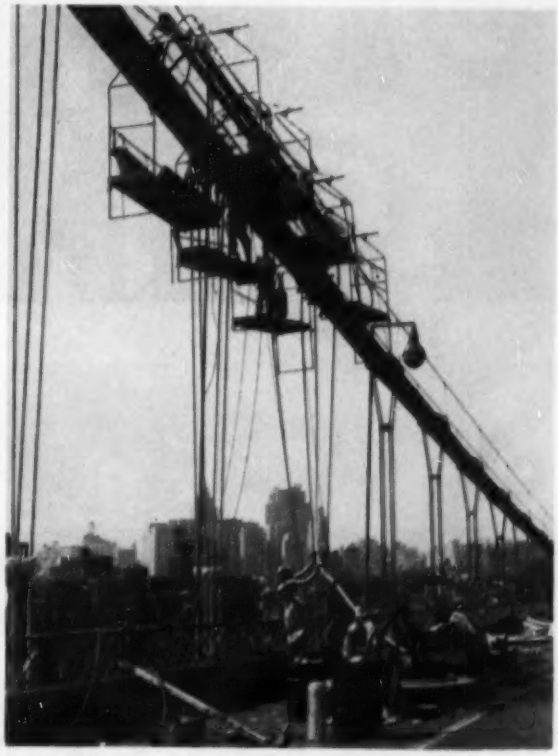
UNIQUE SCAFFOLD rides downhill on suspension cable of New York's Manhattan Bridge. Man in rear controls movement with come-a-long device. Rig rolls on rubber tire and hangs from hand ropes above cable. Working platforms are adjustable.

Cable-Riding Rig Rehangs Old Bridge Deck

SKILLED CREWS working from unique scaffolds hundreds of feet in the air did a fast, efficient job of rehabilitating New York's old Manhattan Bridge. In only five months time, they rehung the long bridge deck from a completely new system of cable bands and suspenders. And they did it with minimum traffic disturbance.

The job was unusual in many ways. Over the years, the character of the bridge loading changed considerably. It became unbalanced and eventually made the original cable band design obsolete and damaged the suspenders.

To rehabilitate the famous old



NEW SUSPENDER ROPE is uncoiled and hoisted. Scaffold is anchored temporarily to cable by clamps at both ends and middle.

REPLACING operation begins at base of ropes. Jack removes load and ropes are cut.

HYDRAULIC PUMP set up on catwalk under bridge deck operates rope-pulling jack.

OLD SUSPENDER ROPE is pulled off cable band (above), attached to scaffold's overhead trolley, moved to center sheave, lowered onto swift (below), and coiled.

MANHATTAN BRIDGE...
Continued

structure, the City of New York, Dept. of Public Works, awarded a $2.1 million contract to John A. Roebling's Sons Corp. calling for the engineering and installation of a new set of bands and suspenders. Only recently replaced suspenders at the centers of the four cables could be left in place. Roebling decided to handle the complex engineering and fabrication but called in Terry Steel Contractors, Inc., of New York, to design the tricky scaffolds and install the new suspender system.

Terry tackled the job one cable at a time. They assigned two crews to the anchorage spans and three to the main span. To prevent any excess loadings, crews were not permitted to remove simultaneously any two suspenders that were less than 160 ft apart.

Basically, a suspender consisted of two 1¾-in. wire ropes looped over grooves in a cable band and reaching down to the bottom chord of the deck trusses. Here, 8-in. nuts anchored the four ends of the ropes to the bridge.

To remove a suspender, workmen attached one end of special jacks to the truss and the other end to the four ropes. When the jacks pulled down on the ropes, tension was removed from the ends, and they were burned off. The jacks were slowly retracted until the ropes hung freely and could be removed by the scaffold crew. The old band was taken down, a new one brought up, new ropes were installed, and the ends bolted to the truss by a reverse of the jacking operation.

But the key to the efficient method was the cable-riding scaffold. Besides supporting workmen, it hoisted and handled both old and new suspender parts. Made mostly of steel tubing, the 1-ton scaffold straddled the cable and rested on three clamps that fitted over the cable. Eight frames of tubing hung from outriggers that projected from double aluminum I-beams. Platforms were made of plywood reinforced by aluminum angles and tees.

To move a scaffold, clamps were lifted up, and the rig rode on a rubber tire in the middle and on pulley wheels on the hand ropes running above the cable. When the scaffold arrived at the next point, the clamps were swung down over

(Continued on page 102)

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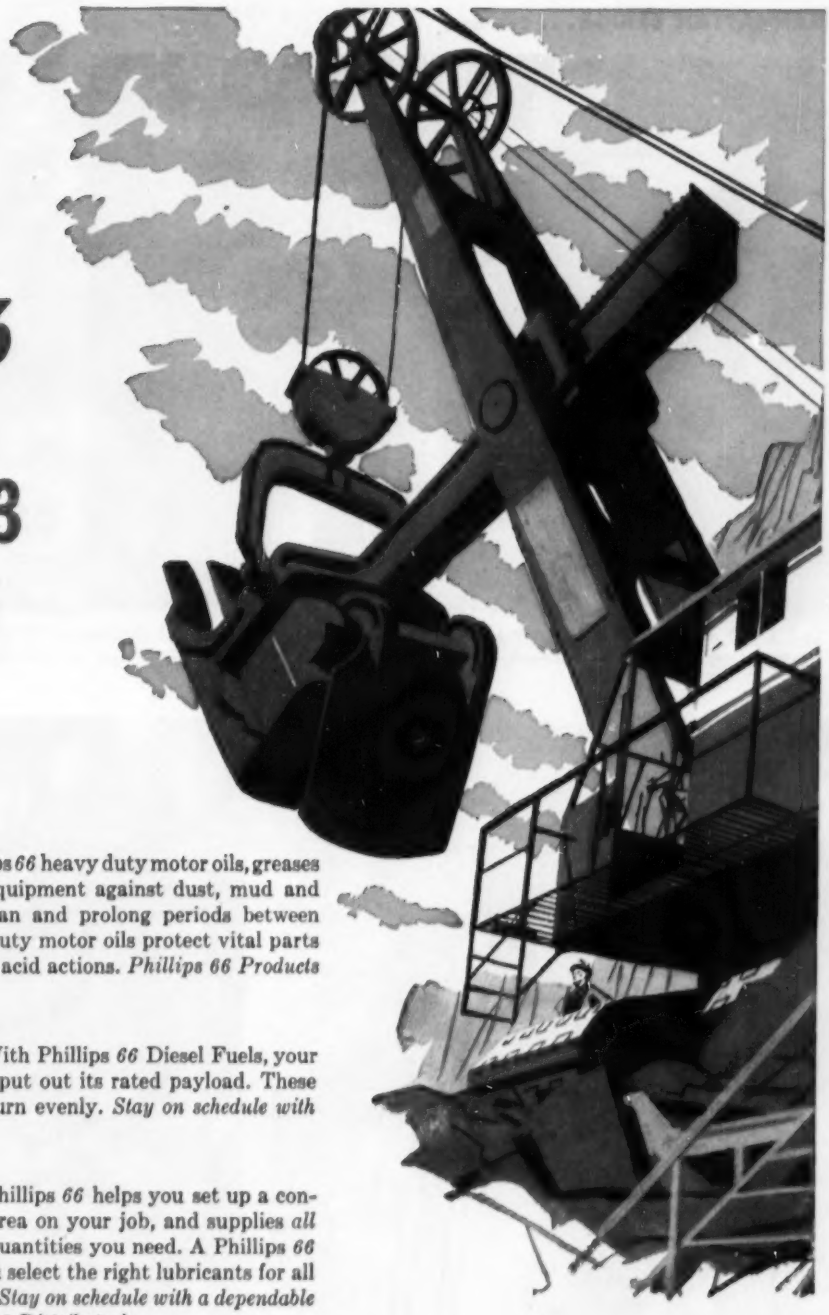

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PHILLIPS 66 HEAVY DUTY MOTOR OILS

Fuels and Lubricants for Construction Machinery

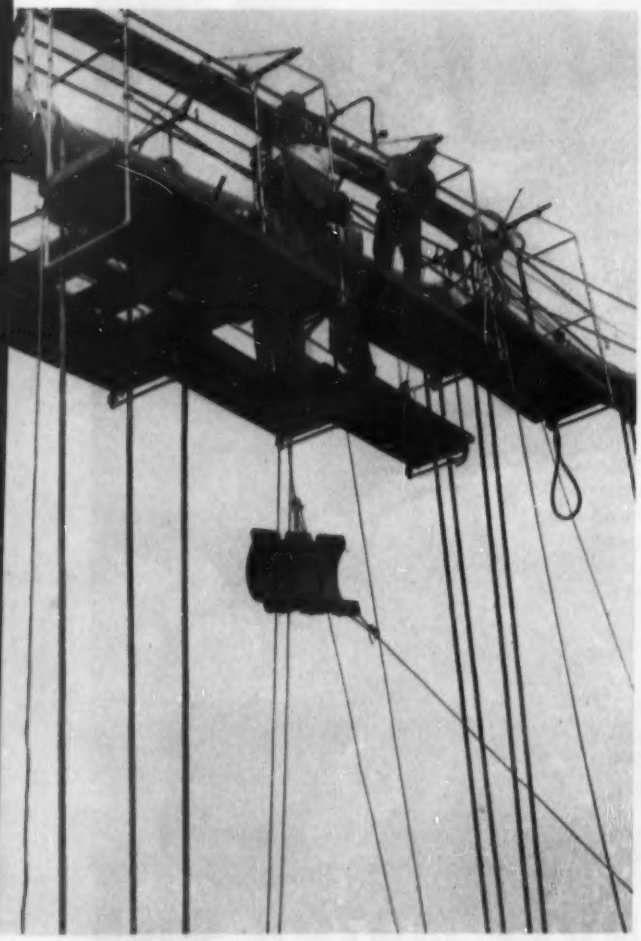
OLD BAND is rotated 90 deg by come-a-long and then attached to overhead trolley for moving to center sheave. Undamaged suspenders hanging aside will be reused.

the cable to remove the load from the band ropes.

For uphill movement, the scaffold was pulled by a line tied to the cable and reeved back through a small American hoist stationed below on the deck. When moving downhill, the scaffold rolled by gravity under a come-a-long control device.

Materials hoisting was done by the American hoist whose load line was reeved through a large sheave attached to the center clamp of the scaffold. When a piece was hoisted to the scaffold, it was picked up by a come-a-long and transferred to a small trolley which rode the scaffold's aluminum beams. Powered by an air drill through a gear reducer, the trolley carried the piece to the end of the scaffold where it was installed. Removing old pieces was done by the reverse procedure.

A typical suspender was replaced



HOIST LINE reeved around center sheave lowers old band through scaffold. Platform sections fold back to permit passage.

NEW BAND is transferred from main hoist line, carried on trolley to end of scaffold, and positioned accurately on cable.

CABLE BAND BOLTS are tightened by Ingersoll-Rand impact wrench. Scaffold pipe serves as compressed air manifold.

STRAIN READINGS on cable band bolts are taken on extensometer to determine tension. Final adjustments are made later.

as follows. Cable wrapping was unraveled on either side of the old band and the wires were cleaned for securing the new band. As soon as the old ropes were jacked and burned off at the bottom, workmen on the scaffold removed the ropes from the band and lowered them to the deck. Ingersoll-Rand impact wrenches loosened the bolts, and the band was pulled away in half sections, transferred to the trolley, and lowered to the deck.

Next, the two halves of the new band were hoisted to the center of the scaffold one at a time, attached to the trolley, and carried to the end of the scaffold. (The exact band position had previously been marked by Terry engineers.) Slowly the pieces were lowered by come-a-longs and fitted around the cable. Perfect alignment between the two pieces was achieved by delicate maneuvering with a malleable tool that fitted into special matched grooves cut into both halves.

High strength bolts were fed through holes in the top and bottom and tensioned systematically. Two new ropes were then hoisted up, placed, jacked, and bolted into position at the bottom. Final tensioning was done on the bolts, and then they were checked with extensometers.

Each gang repeated this operation two or three times a day. Once the men became experienced at their unique task, the job went

(Continued on page 107)

TRICKY MATERIALS HANDLING is assigned to Austin-Western hydraulic crane. Lightweight unit's telescopic boom and 360-deg swing paid off in tight quarters between cables.

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H-104 One-wire braid. Medium-high pressure. Sizes ¼" to 1" I.D.; working pressures 1000 to 2500 p.s.i.

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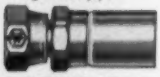
TYPES OF HOSE ENDS

Swivel 37° SAE (JIC) female

¼" grease hose ends. Special female grease tap.

Rigid male pipe



Rigid 37° SAE (JIC) male

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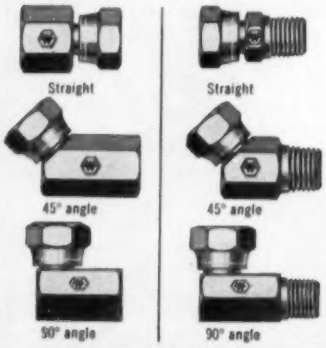
For a wide range of hose and combinations.

Female to Female— Male to Female—



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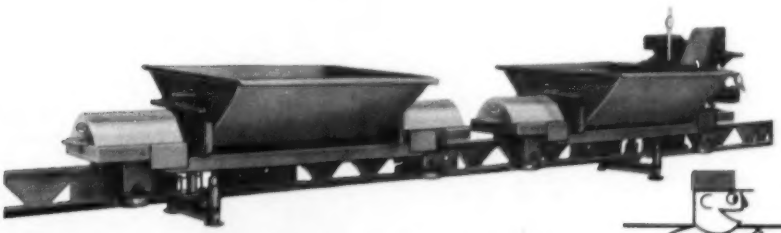
The Rex Railporter, a completely new tool for the construction industry, will go anywhere on its single rail. The Railporter, when loaded at the point of supply is sent on its way by simply engaging the clutch lever for the desired direction of travel. The Railporter follows the rail to its destination where it stops automatically. One man can dump the hopper and return the Railporter to its loading point by engaging the clutch.



RAILPORTER WITH TRAILER UNIT

- **Completely self-propelled ...** operates automatically between loading and discharge points.
- **Operates anywhere ...** in any weather, over any ground condition — reinforcements, muddy terrain, open cuts, excavations, tunnels, water or elevations.
- **Fast set up ...** 100 ft. of rail easily laid by two men in less than 20 minutes. Eliminates costly, old-fashioned wooden runways ... runs on lightweight, long-lasting sectional steel rails.
- **Large pay loads ...** Railporter, complete with trailer unit, handles as much as 26 cu. ft. of materials (liquid volume). Carries liquid, bulk, package block and other construction materials.
- **Simple to operate ...** one lever controls forward and reverse. Stops automatically at any pre-selected point along rail.

CHAIN BELT COMPANY

LEADERSHIP ... through creative engineering

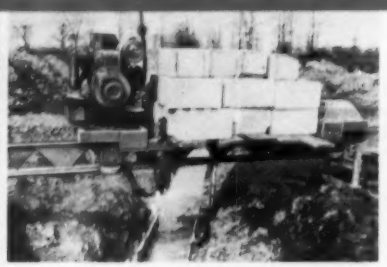
REX RAILPORTER

is in use now on jobs like these . . .

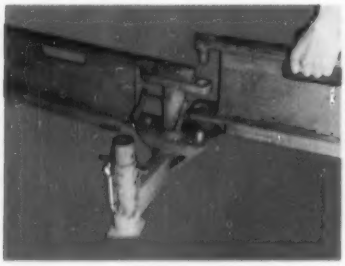
A REX RAILPORTER, used with a trailer unit, discharged concrete in this multi-story operation. Note how the sturdy steel rail was laid across the floor opening and over reinforcing wire.

HEAVY RAINS turned this housing project into a sea of mud, but these conditions did not hold up operations — concrete was delivered on schedule to place footings. Note perfect rail alignment not necessary.

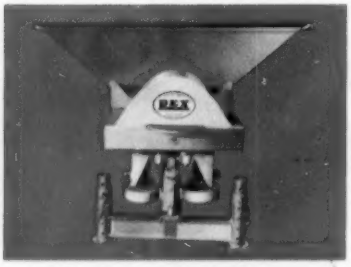
ON THIS JOB two Railporters with trailers worked on a closed circuit to pour concrete for a 185 foot long slab. 350 cubic yards were poured per day by a crew of nine men, including spreaders and vibrator men.



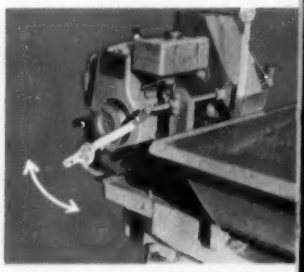
BY REMOVING the Railporter hopper, contractor hauled concrete block over foundation forms and spotted blocks quickly around the job. Contrast this fast method with old-fashioned ramps and runways.



EACH RAIL SECTION is supported at its ends in sturdy rail stands and joined by means of a slip-pin connection and lock. Rail stands have adjustable legs to compensate for uneven ground.



PERFECT STABILITY — The two driving wheels ride on the top of rail and the horizontal stabilizing rollers ride along the lower side flanges of the rail, insuring perfect stability.



SIMPLE CONTROLS — *Push* clutch lever for *forward* travel. *Pull* for *reverse* travel. Vertical lever in middle is provided for manual stops.

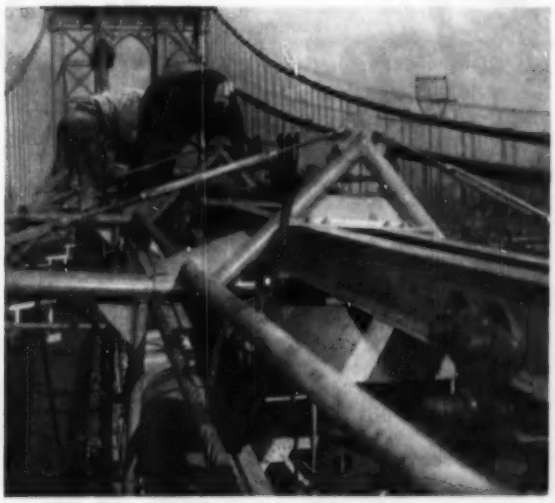
Ask your Rex Distributor to show you the revolutionary Rex Railporter! Learn how the Railporter will cut your handling costs, operate over any ground condition in any weather and keep even your most difficult jobs right on schedule . . . or write CHAIN Belt Company, Construction Machinery Division, for the Rex Railporter Bulletin No. 56-47.

CHAIN BELT COMPANY

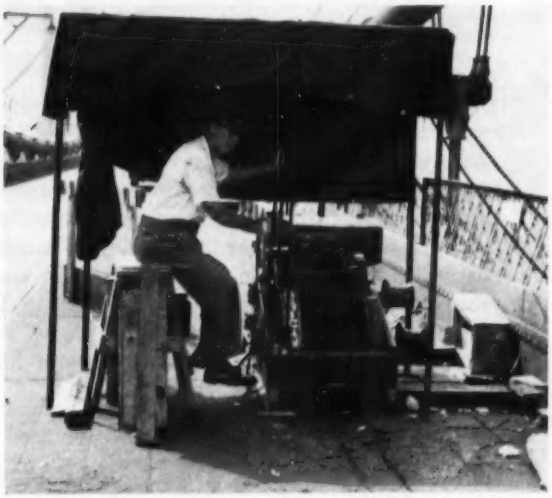
CONSTRUCTION MACHINERY DIVISION

4664 WEST GREENFIELD AVENUE • MILWAUKEE 1, WISCONSIN

MOTOR SCOOTER quickly carries superintendent along narrow bridge deck. Small turning radius pays off in traffic.



A-FRAMES atop scaffold support outriggers. Small trolley rides on double aluminum beams and is powered by air drill.



AMERICAN HOIST on bridge deck pulls scaffolds up cable and also raises materials to them through large suspended pulley.

MALLEABLE TOOL that fits into matched grooves on cable bands assures perfect alignment of two halves. Tool remains in band.

smoothly. In fact, it took Terry only five months to replace both bands and suspenders at 427 points and bands only at 157 points.

Terry's work had to be well-organized because of the difficult materials handling problem. Specs permitted the contractor to close only two adjacent lanes of traffic at once. And during rush hours, one of the two lanes had to be reopened.

This meant that Terry had to maintain a stretched-out working yard on a single lane. And he had to be ready to shift it to another lane as soon as a cable was completed. The yard held trailer offices, stockpiled materials, and equipment.

Because of the traffic problem, Terry scheduled all deliveries during off hours when the 2-lane area was available. With an Austin-Western hydraulic crane, the contractor easily unloaded trailers, swung loads around in the restricted area, and stockpiled the bulky material. The rig's 360-deg swing was indispensible for swinging big loads in tight quarters. Its light weight was important because of floor-load restrictions, and its adjustable 35-ft boom paid off when reaching into covered trailers.

The final phase of the contract is now under way. The contractor is replacing the wrapping wire disturbed by the replacement of the cable bands. At the same time, the suspenders are being readjusted to improve the stress condition of the suspended roadway and trusses.

Frederick H. Zurmuhlen is Commissioner, Samuel Cooper is Dir. of Bridges, and Ted Mombelly is resident engineer for N.Y.C.

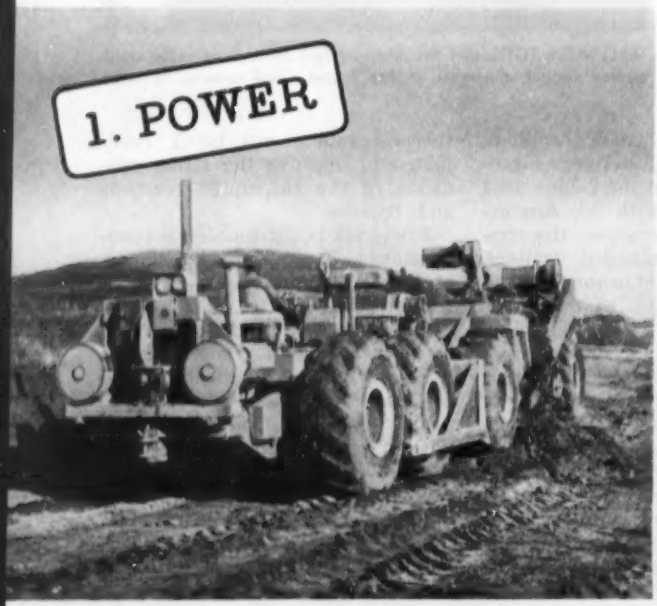
For Terry Steel Contractors, Inc., Ward Cartee is general superintendent, Steve Burghardt is superintendent, Philip Wolf is project engineer, and John Deerkowski is shop superintendent.

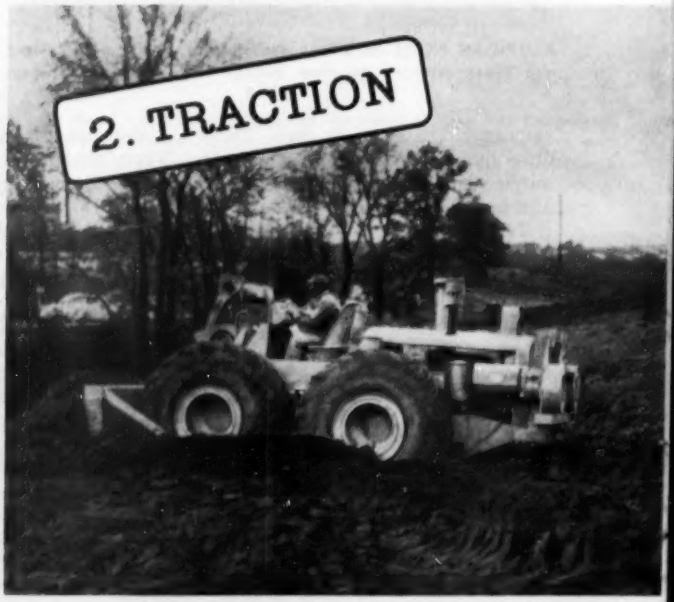
John A. Roebling's Sons Corp. is represented by Blair Birdsall, chief bridge engineer, Harold Hills, erection manager, John Nixon, project engineer, and Oscar Parker, superintendent.

Times have changed...

today we face new dimensions in earthmoving

Today's demand for miles on miles of superhighways, more and bigger airports, dams and waterways, gigantic land-reclamation projects, and fabulous sub-division construction, has compelled change to bigger yardage contracts with shorter job-completion time-limits. The resulting need for moving more yards in less time has created a new emphasis on the work dimensions of your heavy-duty earthmoving equipment.





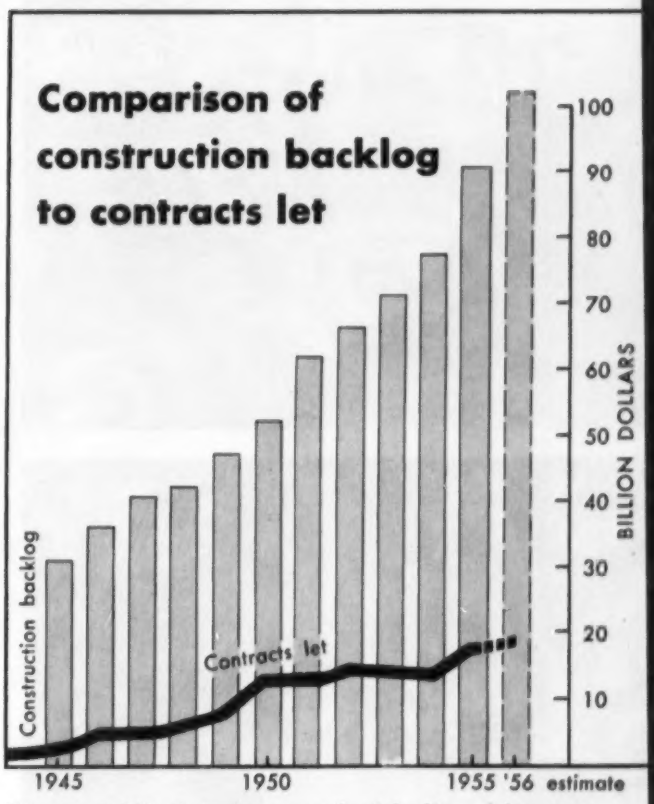
Examine your present equipment inventory now in view of the

Gone are the days, not so long ago, when you could evaluate tractors by measuring the drawbar ratings which showed merely the combined work dimensions of horsepower and traction. These were enough to measure the work capacity of yesterday's tractors in yesterday's jobs. But today's larger projects, shorter job-completion restrictions, and increased labor costs, have added *two more* dimensions to tractor requirements. These new dimensions are *speed* and *mobility*.

Not only do these newly important dimensions require careful study of speed ranges in mph, but they also call for close scrutiny of minor delays for gear changing, turning, spotting, loading, spreading, and return, plus delays for lubrication and service, as well as time for moving to other assignments. So, today, the buyer must measure all the factors that enter into the best performance in *all four dimensions*...power, traction, speed, and mobility...to decide which tractor will earn the greatest return on his investment.

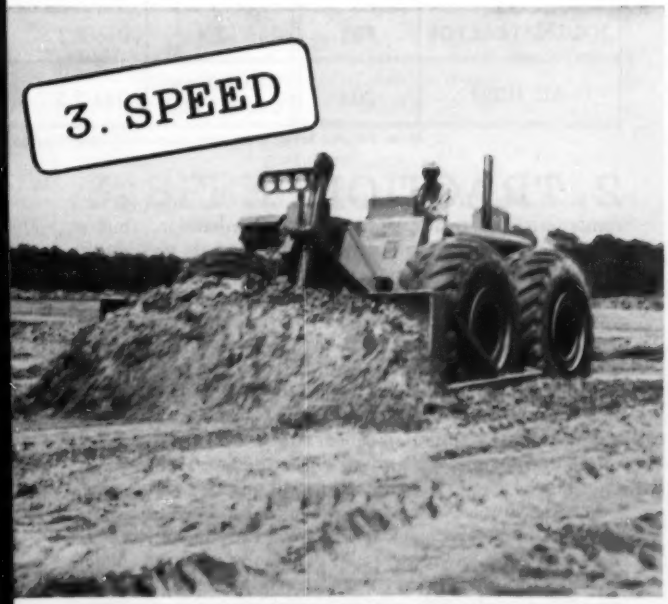
To help you in your analysis of today's leading heavy-duty tractors, and the extent to which they measure up to the needs of the *four dimensions* required for maximum profit on today's earthmoving assignments, study the important information detailed on the following pages covering:

1. POWER
2. TRACTION
3. SPEED
4. MOBILITY



This recent ENR chart shows growth of backlog of heavy construction works in planning stage over the past 10 years. Twenty billion dollars construction in '56 will apply against record backlog of ninety-three billion at end of '55. But new planned work will pile the '56 backlog even higher to a fantastic 105 odd BILLIONS of DOLLARS.

See next page



expanding future and the need for four-dimensional tractors

Plan your
FOUR DIMENSIONS

To get your share of future business, and profits, you need *power*...not only to "bull" out the heavy loads, but to move the largest loads possible, at the highest possible speeds.

You need *traction*...to take advantage of the available power. Traction to work on steep grades ...traction to hang-on in slippery footing and loose materials.

You need *speed*...to keep pace with today's demand for faster job-completion...speed to move more dirt on longer hauls...speed for quick returns.

And, for today's larger and larger jobs, you need *mobility*...to handle scattered assignments in less time...to meet emergencies of job or weather... to step-up production on sections behind schedule ...to move fast job-to-job, without need for special hauling equipment.

Study relationship of pull to speed:

TRACTOR	HP with torque converter	Speeds in MPH	
		Forward	Reverse
CAT D8	191	0 to 3.6 low 0 to 7.4 high	0 to 3.6 low 0 to 7.4 high
IH TD24	200	0 to 7.6	0 to 6.6
TOURNATRACTOR	208	0 to 17.4	0 to 7.3
AC HD21	204	0 to 3.0 low 0 to 7.5 high	0 to 5.5

Note: Figures taken from manufacturers' specification

1. POWER... is of prime importance, but, today, you need to consider engine horsepower as a *source*, not a "force". Maximum horsepower ratings considered alone are without meaning. Ratings must be studied across the speed range to measure their effectiveness in push-pull effort at desired operating speeds. Also, you need to check the smoothness with which power is applied; the time-factor in making a deep cut, and the difficulties in shifting which may discourage an operator from using the proper gear ratios to apply power with greatest time efficiency. Check, too, the percentage of time where you use the combination of power and traction for maximum push-pull. You will find power at maximum "drawbar" is seldom used for tractive effort. Since *all* tractors are able to spin their tracks or wheels in low gear on normal footing, horsepower should be considered only as a power source...available for use in *any direction*. The most effective power combination lets you work at highest practical speeds which job conditions permit. (See table above)

2. TRACTION... Pounds-pull is a combination of power *and traction*. Compare it...but at *your* desired operating speeds. Usable pounds-pull results from many factors: type of material, conditions underfoot, weight of tractor, and forward speed. From the table above, you can see that Tournatractor pounds-pull compares favorably with track-type tractors from 2.0 mph up. Even if Tournatractor takes a thinner initial cut, its time advantages in stepping up speeds, gives you a faster overall cycle. Wide-base rubber tires now available on Tournatractor can give still more traction on rubber. Its anti-friction drive and minimum of moving parts give you far less loss in power transmitted to ground-contact. It eliminates loss of power due to accumulation of mud and dust in tracks. Its compaction characteristics give a major advantage on fills and haul roads. Its low-pressure air-cushion and flexing rubber-treads can provide even better traction than crawlers in many materials. They permit work and travel without planking over pavement, curbs, and rocky footing.

advertisement

future around the

of tractor earthmoving

In order to fully capitalize on tomorrow's opportunities, your tractor fleet of today must qualify in all *FOUR* of today's tractor dimensions...power ...traction...speed...and mobility. Your present heavy-duty track-type tractors have adequate power and traction. But most lack speed in their working ranges...none meet your important needs in the fourth dimension — mobility.

Tournatractor leads the comparative crawlers in power, and matches crawler pull in higher gears (over 2 mph), but has less traction for pull in lowest gear (under 2 mph). It matches crawler speed and traction in the work range, saves time and momentum with instant gear changes, has twice the travel speed, along with full mobility to move cross-country or via highway to the next work assignment. To make maximum profits in the expanding opportunities ahead, you NEED both the low-speed traction advantage of the crawler and the high-speed mobility of Tournatractor!

Pounds of pulling effort			
1.5 mph	2.0 mph	2.5 mph	3.0 mph
30,000	24,000	18,000	15,000
32,500	22,500	18,000	15,000
24,700	23,500	18,800	15,650
Pounds-pull curve not shown in manufacturer's literature available to us.			

sheets available to us at time of printing.

3. SPEED...

today is a major dimension in every piece of equipment you use. For years crawler engineers have struggled with this problem. They have made improvements, but find it difficult to overcome the friction-losses and wear-costs involved in stepping-up crawler speeds. With 4-wheel-drive, instant-shift, constant-mesh transmission, torque converter, instant controls, and anti-friction-drive, Tournatractor has a combination of speed factors not equalled by any crawler. With twice top-speed of heavy-duty crawlers, today's Tournatractor has many other savings in each cycle that contribute to its *speed* performance. You've seen the load build up on a crawler's blade, but have you checked the other components of the crawler's day? Carrying-the-load, spread, return, wait-and-travel time, are all part of your cost and call for long-term time-study. Figure, too, the few times where crawler maximum-drawbar at low speed gives you a production advantage; then compare with the much larger time percentage where extra speed can pay off in profit.

4. MOBILITY...

Crawler-moves, job-to-job, or from section to section, require moving in of truck and flatbed, loading and unloading time, plus actual travel-time. These high moving costs make crawlers expensive on hit-and-run assignments. Yet today's large-area contracts need far more equipment movement than ever before. Tournatractor can be at work a mile away in less than 5 minutes...lets your pushers be as flexible as your prime-mover scrapers when moving to a new area...for instance, to work drier borrow during wet weather. Mobility also gives you flexibility to quickly balance pushers as well as scrapers when hauls vary. It lets you use idle time to improve haul roads, detours, or drainage. It makes quickly available ripper, stumper, or compaction service anywhere on your project. Mobility is an important dimension in today's dirtmoving...will be more important in your larger future. Think it over, remember some of your last year's projects and count the times when a 17.4 mph tractor could have saved you money and stepped-up profits.

See next page

Tournatractor now available with big new 26.5 x 25 wide-base tires...has greater flotation and improved traction.

10 years of constant improvement

to meet your needs of today

More than 3,000 Tournatractors are now in service all over the world. During the past 10 years these machines have operated in all types of materials, in extreme climates, and under every conceivable working condition.

Tournatractor, when introduced in 1946, was a new and revolutionary product. Early models developed mechanical difficulties in the field. These difficulties were carefuly analyzed and corrected. Over the years we have gathered accurate performance data on Tournatractor's operation in a wide variety of applications, then used this information as a guide in our program of constant improvement. As a result, today's Tournatractor far outperforms early models. It pushes and pulls bigger loads...gives better performance in its lower speed ranges...is easier to operate...has minimized service requirements...is comparable with crawlers in mechanical operating efficiency. Tournatractor ...with effective performance in *all four dimensions* of power, traction, speed, and mobility...warrants serious consideration as a work unit in your tractor fleet to meet your needs of today...and tomorrow.

Send for **28-page book..."Use all 4 dimensions"**

This book gives you a factual appraisal of heavy-duty tractors available today, and their place in your future. It is yours for the asking.

Take a New Look at Tournatractor

Consider these many advantages on your work, now and in your future:

Power...208 hp — more than any crawler tractor in its class...with less pounds-pull in the starting speeds, but more pounds-pull in the working speeds used most of the time. Operators work at higher speeds, with more yardage moved per day.

Traction...greater than ever! New, optional wide-base tires give still more ground contact area and better flotation in many soil conditions. Additional traction, when needed, is easily obtained by hydro-flating.

Speed...forward to 17.4 mph, and reverse to 7.3 mph. Instantaneous shift through constant mesh...no loss of momentum. Instant controls. Anti-friction bearings throughout power train cut power loss, give more use of speed.

Mobility...Tournatractor travels twice as fast as crawlers to reach on-the-job assignments and to travel job-to-job under its own power. Saves time and cost of hiring flatbed haulers and extra help to load and unload.

Shifts instantly...no stops, no lost momentum...gear ratios changed instantly by Tournatractor's constant-mesh transmission. Saves at least 5 seconds on every gear shift, as much as 80 minutes per 10-hour day.

Torque converter...a simple, trouble-free, low-pressure unit with single impeller, reactor, and turbine. Eliminates shock-loads, automatically increases engine torque to match load, provides unlimited speed-flexibility, increases operator efficiency.

Husky, all-welded case...provides a sturdy base. Moving parts are held in perfect alignment, last longer. All parts easily accessible through handy cover-plates. No independent oscillating assemblies to spring out of line.

Anti-friction gear-trains...heavy-duty, precision-cut gears mesh smoothly. Special heat-treating produces wear-resistant surface on tough cores. Constant oil-bath reduces wear. Shafts ride on anti-friction bearings, reducing power-loss and wear.

Grouped lubrication through fewer fittings, oil enclosures, and far fewer moving parts, combine to save operator about 5 min. work-time each shift. Sealed protection keeps abrasive dust, mud, water and other elements sealed out...lubricants sealed in. Saves lubricants, saves time, saves wear.

4 tires vs over 500 track parts... four tough tires eliminate multitudes of exposed wearing parts such as track rollers, bushings, pins, shoes, and seals. Reduces service, cuts costs.

Safe to operate...low center of gravity, all-around visibility, accessibility and quick response of controls, make Tournatractor exceptionally safe to operate. Multi-disc air brakes have *four times* the braking surface of most heavy-duty tractors.

Interchangeable equipment...Bulldozer, Angledozer, Root-Rake, Snow-Plow — all interchangeable — extend Tournatractor usefulness in a wide work-range. Tilt-mechanism and down-pressure attachment on dozer also available. Tournatractor pulls any type drawbar equipment.

Tournatractor can tackle tough jobs, such as breaking up rock-seams, pavement, etc. Faster push and return save time. On long cycles, on-job and between-job moves, Tournatractor speed is doubly important.

Tournatractor's sealed power-train permits travel through water, mud, dust without loss of power. Lubricants are not washed away nor filled with abrasives. Maintenance is less since 4 wheels do work of 500 track parts.

Tournatractor takes shortest route to job, via highway or cross-country. It drives through city streets without interference to traffic . . . big, low-pressure tires do no damage to blacktop, curbs, or railroad-tracks.

Tournatractor travels and works over any type of footing to clear land, push-load scrapers, dig ditches, spread fill, stockpile materials, maintain haul roads, back-fill around culverts, pull other equipment.

See Tournatractor work on one of your own jobs

The best way to judge today's improved Tournatractor is to see it in action on one of your own jobs. We urge you to contact your local LeTourneau-Westinghouse Distributor, or write the factory, and we will arrange to demonstrate one of these machines so you can compare its profit possibilities with your present heavy-duty tractor equipment.

Tournatractor, Angledozer—Trademark Reg. U.S. Pat. Off. CT-1104-G

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

Crush Stone Fast for Kansas Pike

AMIS CONSTRUCTION CO., Oklahoma City, has put together an effective combination of modern rock crushing equipment to speed a 400,000-ton crushing assignment for the Kansas Turnpike. Large jaw crushers and a triple-roll unit pour out 235 tph of sub-base rock. And a combination of jaw crushing and scalping screens in one unit, teamed up with a portable crushing plant, is producing 95 tph of aggregate for hot-mix paving.

Amis rock crushing crews moved in shortly before Christmas and have worked all winter and spring getting sizable stockpiles of material ready for this season's use. A single quarry at a limestone outcrop will produce all sub-base and base-course rock for more than 10 mi of the road from Augusta west. Although the job is only one of many along the toll road, it exemplifies the crushing problem that contractors have met.

One headache has been a scarcity of good rock with favorable crushing characteristics. The native limestone has a high percentage of moisture (about 8%) and tends to pack — rather than crush — under breaking action. Also, clay topsoil overlying the formation introduces high plasticity index material unless extreme care is used. Since specifications limit the PI to a maximum of 5, Amis wastes about 8% of the raw material input even to make crushed sub-base rock. On asphaltic-concrete aggregates, waste is 1/3 total input.

ROCK FROM QUARRY (rear) is trucked to base-course crushing plant and dumped to apron feeder (right). It proceeds through 30x42 jaw crusher, 20x36 twin jaws, 54x24 triple-roll crusher, and finally ends up in bin (left) for removal to job by truck.

Base-Course Rock Production

Specifications for sub-base and base-course rock (See table) were worked up by architect-engineers Brink-Dunwoody-Rector of El Dorado, Kan., under general supervision of Howard, Needles, Tammen & Bergendoff, general consultants to the Kansas Turnpike Authority. Tolerances make it possible for Amis to produce both materials simultaneously by hitting a norm of sizes acceptable to both gradations. On the No. 40 size, for example, 25% passing would meet both specifications.

In the quarry Amis blasts the limestone for loading by a 2½-yd Northwest shovel into 8-yd Euclid trucks. These dump on to a Pioneer 42-in. apron feeder that discharges into a Pioneer 30x42 overhead eccentric jaw crusher powered by a 150-hp Caterpillar diesel. A grizzly screen deck just ahead of the jaw crusher permits fine particles (7-in. minus) to bypass the jaws. All oversize limestone, hard to reduce because of its saturated, rubbery condition, goes into the jaw crusher. Throughs from this crusher, along with bypass material, drop to a 36-in. Pioneer conveyor leading to a Cedarapids secondary crushing unit.

Here material feeds on to the upper deck of a 4x12-ft vibrating screen with a 4-in. square mesh. Particles retained on this mesh drop into a 20x36 twin-jaw crusher for further reduction. The screen's bottom deck is equipped with a ⅝-in. mesh that passes all dirt and clay by conveyor to a waste pile.

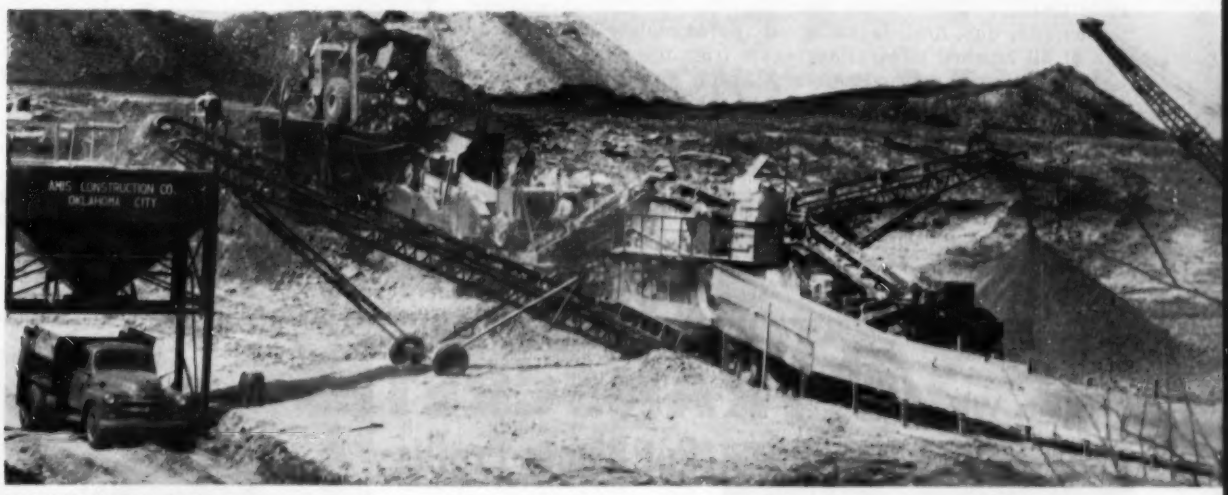
Everything retained on the ⅝-in. screen bypasses the twin-jaw arrangements. It is conveyed to the top of a Cedarapids 4x8-ft vibrating screen that passes 1¾-in.-minus out to a 45-ton surge hopper. The fraction retained on the screen goes to a Pioneer 54x24 triple-roll crusher powered by 190-hp Murphy

SCREEN	SUB-BASE ROCK (% Passing)	BASE-COURSE ROCK (% Passing)
2 in	100	100
1½ in.	100-75	100-70
1 in.	100-60	100-60
½ in.	95-45	-
⅜ in.	-	95-39
No. 4	80-25	75-25
No. 10	65-17	55-17
No. 40	40-8	30-8
No. 200	10-0	10-0

and 75-hp General Motors diesels. The output from this unit passes back over the vibrating screen for final sizing and, if necessary, a return trip through the rolls. The final product is conveyed to the surge bin where trucks either stockpile the material or haul it to the highway. Production averages 235 tph.

According to Crusher Superintendent Harold Wilkins, the latitude in adjustment with the 30x42 jaw crusher, the 20x36 twin jaws, and the 54x24 rolls have permitted the size requirements to be made quite easily. But the finished mix, as stockpiled, is deficient in most of the finer sizes because all those were removed (along with dirt) by the ⅝-in. waste screen. Fines are replaced by bringing in an excellent grade of sand produced nearby from the Arkansas River bed. This sand is added to the crushed rock when it is placed on the highway in the right amount to bring the total mix to the middle of specification tolerances.

TRIPLE-ROLL CRUSHER is set up in closed circuit with 5x8-ft vibrating screen that separates finished 1¾-in.-minus rock.



ROCK FROM PIT is hauled to aggregate crushing plant and dumped to grizzly (left rear). It goes through 20x36 jaw, 10x36 jaw, and 40x22 roll crushers. Grizzly, scalping screen, and first jaw are one portable unit. So are other jaw, roll, and their screens.

Portable Plant Produces AC Rock

Amis also is producing aggregate for hot-mix paving. Hardness and absorptive factors of rock from the main quarry prevented it from meeting specifications for plant mix. It was necessary, therefore, to move approximately 2 mi north of the Turnpike and about 3½ mi. away from the first pit to produce this aggregate.

Even though the native rock is acceptable, the problem here is to get rid of all dirt and objectionable fines and crush the aggregate 100% from good sound limestone rock. It's tough crushing. Surface course aggregate is all ¾-in.-minus, and binder course aggregate is 1-in.-minus.

Amis installed a Pioneer unit that includes a scalper screen and a 20x36 jaw crusher, all mounted on a portable frame. It handles initial separation of waste and primary crushing. To this was added a Pioneer 46-VE Duplex rock plant with 10x36 jaw and 40x22 rolls, along with screening decks, to take care of final reduction and sizing.

Dumptors haul pit-run material to the plant feeder where the rock enters over 5-in.-clearance grizzly bars. These separate finer material, permitting it to bypass the 20x36 primary jaw. Here also, a scalping screen separates everything from 2 in. down through the clay and dirt sizes, which is sent to a spoil pile by Pioneer 24-in. conveyor. Spoil represents about 1/3 the total input at the feeder and is bulldozed from time to time into a gully nearby.

From the plant feeder, chunks 5 in. and greater pass through the 20x36 jaw unit which is driven by a 125-hp Caterpillar diesel. Jaw throughs join material retained on the 2-in. scalping screen, and all are conveyed to the center deck of the Pioneer 46-VE plant. Here a 1-in. screen passes the acceptable fraction out to a surge hopper.

Material retained on the screen goes to a 10x36 jaw crusher and returns to the top screen deck, also equipped with 1-in. mesh. Material retained on the top deck passes through the plant's 40x22 roll crusher which is arranged in closed circuit with the top screen. This flexible arrangement permits the operator to adjust jaws and rolls so that a balanced load is on each at all times. There is plenty of power (150 hp) on the 46-VE plant to run the unit and operate an electric generating set from the same shaft. Aggregates, as finally sized, are conveyed to surge-bin

(Continued on next page)

WASTE MATERIAL dumps off to the side, leaving only good rock for the manufacture of asphalt hot mix aggregate. Contractor gets about 95 tph of all crushed mineral aggregate from portable plant and about 235 tph from sub-base production setup.

KANSAS TURNPIKE STONE . . . Continued

storage for truck haul to the asphalt plant where the sand fraction of the mix is added.

Day after day, Amis is taking out approximately 95 tph of all crushed mineral aggregate from the portable plant and approximately 235 tph from the sub-base production setup. In view of the limestone's stubborn crushing characteristics the plant has made one of the better production records on the Kansas Turnpike in early-stage crushing.

Completed in Fall

Project officials estimate that the toll facility will be ready for service this October, thanks to production records now being set on sub-base and paving contracts. The completed road will consist of two 24-ft divided traffic lanes. Outboard of each lane will be 10-ft shoulders, given a double asphalt-penetration treatment. Shoulders on the median edge of each paving strip will be 4 ft.

The highway will start at the outskirts of Kansas City, run west through Lawrence and Topeka, then angle southwesterly through Emporia, El Dorado, and Wichita, and then head due south for Oklahoma to join projected toll facilities in that state. Gale Moss is general manager of the Kansas Turnpike Authority, and L. W. Newcomer is contract engineer.

3 Simple Reasons Why TRANSCRETES®

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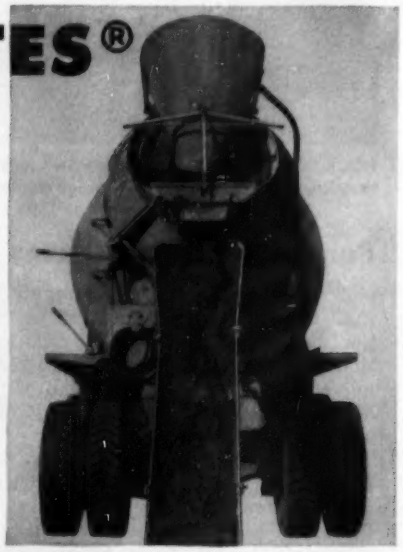

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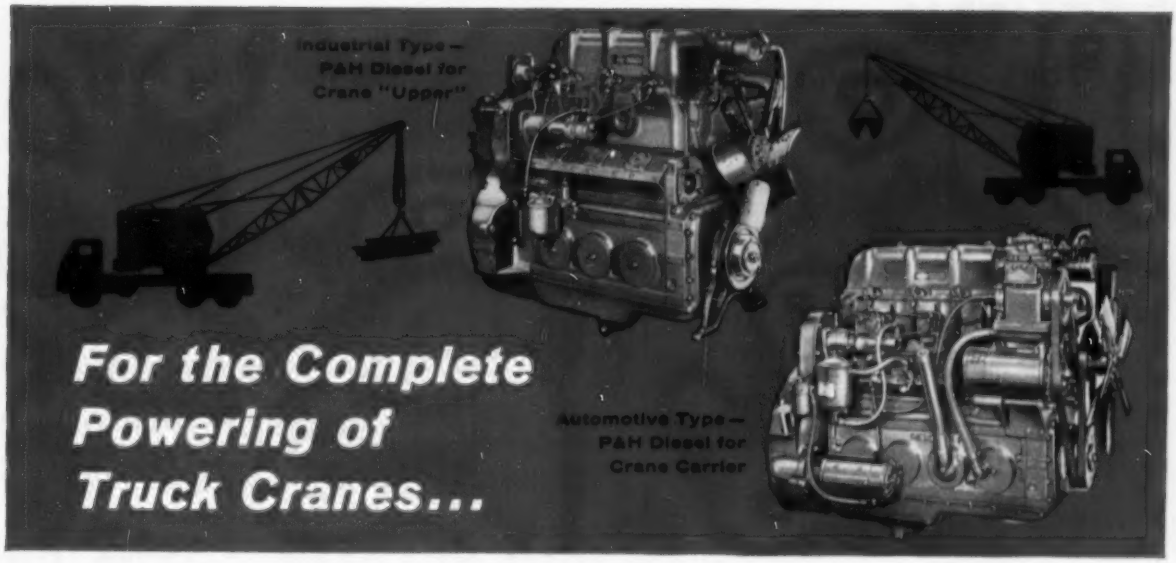
Construction Machinery Co., Waterloo, Iowa



IT PAYS TO STANDARDIZE ON P&H DIESELS

In the *past* Diesels have never been welcomed for the *complete* powering of truck cranes. Slow starting—stalling while idling—insufficient acceleration have proved handicaps to their acceptance, especially for powering of the carrier.

Now these limitations to the use of Diesels for *complete* powering have been totally overcome through new P&H product developments. Highly responsive P&H Engines—Series C-18 accelerate and decelerate as fast—idle as well without fouling or clogging—start in normal temperatures as quickly as a gas engine.

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For the first time you can burn fewer gallons of low-cost Diesel fuel in *both* truck crane engines. Use of 2 similar type P&H Engines also results in easier understanding and better maintenance of *both* engines by *one* man. Savings are substantial, too, on parts inventorying and repair costs. All wearing parts are interchangeable between P&H Engines.

If you want money making and money saving power, it will pay you to investigate the *complete* powering of your truck cranes with P&H Diesels.

P&H Product Development Features In New Series C-18 P&H Diesels

For Quick Starts—automatic retarding of the fuel injection until P&H Engine speeds reach 500 r.p.m.

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For Dependable Power—new P&H Power Assembly, new cooling system, new dual porting of cylinders for better combustion—more power.

For Less Down-Time—simplicity of P&H Diesel design, interchangeability of all wearing parts and the P&H "Unitized" Power Assembly.

P&H Diesel Engines are available in 2, 3, 4, and 6 Cylinder Models for the complete powering of truck cranes from 15 to 35 tons in size.

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TRACTORS - (Track-type) - 1956

Specs for Your Files . . .

	TRACTOR Make and Model	GENERAL DATA: Length (ft.)	Height, (ft.)	Width (ft.)	Gage (ft.)	Weight, lbs. (Lbs.)	Ground Clearance (in.)	Type Steering	Turning Radius (ft.)	Price, lbs., FOB Factory	Drawbar HP rating	Belt HP rating	Net engine HP	STANDARD TRACKS: No. of Shoes, Each Side	Length (in.)	Width (in.)	Ground Contact (Sq. in.)	MAX. DRAWBAR PULL, LBS. (NORMAL GOVERNED ENGINE RPM): 1st	2nd	3rd	4th	5th	6th
1	ALLIS-CHALMERS HD-6	127	69	79	60	12,400	11 1/2	Clutch	84 1/4		45	55		33	64 1/4	13	1,671	11,525	6,780	4,890	3,960	2,650	
2	HD-11	154	84	96	74	20,500	13 5/16		105		75	85		38	85 3/4	16	2,744	20,000	13,250	9,300	7,000	5,700	4,200
3	HD-16	178	90	96	74	31,900	14 3/8		112		125	141		38	96 5/16	20	3,853	33,180	21,735	15,105	11,270	9,465	6,930
4	HD-16C	178	90	96	74	31,600	14 3/8		112				150	38	96 5/16	20	3,853			Torque Converter			
5	HD-21	195	99	109	84	44,000	16 1/8		124				204	37	106 5/8	24	5,118			Torque Converter			
6	TERRATRAC (Amer. Trac. Co.) 200	92	63 1/2	52	42	4,820	16	Controlled Differential	84	$2,827	(a)	(a)	(a) 33	30	54	10	1,086	5,120	3,240	1,970			
7	300	92	63 1/2	59	48	4,900	16		84	3,270			34	30	54	11	1,188	5,500	3,520	2,150			
8	400	101	63 1/2	60	48	4,980	16		84	3,826			38	31	57	12	1,368	5,990	3,770	2,305			
9	400 D	101	63 1/2	60	48	5,170	16		84	4,466			33	31	57	12	1,368	5,300	3,350	2,040			
10	500	101	63 1/2	61	48	5,215	16		84	4,308			45	31	57	13	1,482	11,200	7,180	Torque Converter 2,600			
11	500 D	101	63 1/2	61	48	5,375	16		84	5,002			40.5	31	57	13	1,482	10,080	6,460	Torque Converter 2,390			
12	600	101	65	63	49	7,170	17	Constant Mesh Trans.	116	5,885			56	34	62 5/8	14	1,760	15,860	9,000	Torque Converter 7,750	4,450		
13	600 D	101	65	63	49	7,430	17		116	6,628			56	34	62 5/8	14	1,760	15,860	9,000	Torque Converter 7,750	4,450		
14	CATERPILLAR D2	106	61	55	40	7,175	9	Clutch	68	$5,200	38	43		32	61	12	1,460	7,250	5,170	4,110	3,270	2,145	
15	D4	139	69	65	50	7,430			76	5,290													
16	D6	147	75	78	62	10,375	11 7/16		75	7,045	50	54		31	61	13	1,589	9,550	6,930	5,390	4,110	2,600	
17	D7	167	81	97	74	25,970	15 1/2		116	15,495	102			37	94	20	3,775	25,900	17,720	11,960	7,560	5,280	
18	D8	195	91	100	78	39,660	13		125	23,300	155			42	111	22	4,917	39,150	30,900	21,000	14,120	9,490	
19	D8TC	205	89	103	78	39,925	13		135	25,660			191	42	111	22	4,917			Torque Converter			
20	D9	214 3/4	105	110 3/4	90	56,765	20 1/2		160	34,075	230			43	129 3/4	27	7,006	62,330	47,840	34,790	24,150	17,070	11,180
21	D9TC	214 3/4	105	119 3/4	90	56,670	20 1/2		160	37,310			286	43	129 3/4	27	7,006			Torque Converter			
22	JOHN DEERE 420C (4-Roller) (b)	102	51 7/8	60 1/4	36	4,210	12	Clutch	72	$2,628	24	30		31	56	10	1,120	(a)					
23	EIMCO 630	71	28	55	45	6,500	6	Twin Motors	45	(C) $5,670		25		28	43 7/8	9	790	Torque Motors, 10,600 Lbs. Max. (Zero Track Slippage)					
24	105	151	82	94	74	28,000	11	Unidrive Trans.	89	(D) 15,960		132(D)		40	95	20	3,800	Torque Converter L-45,000 H-15,800					
25	EUCLID TC-12(e)	196 5/16	97 3/4	136	110	58,100	20	Power to Each Track	91 1/2	$42,500			365	39	115 5/8	26	6,000			Torque Converter			
26	INTERNATIONAL T-6	104	63 13/16	63	50	7,730	8 3/4	Clutch	74	$4,675	41.5	46		32	50 3/4	12	1,407	8,000	6,190	4,250	3,380	2,220	
27	TD-6	104	68 13/16	63	50	8,050	8 3/4	Clutch	74	5,593	41.5	46		32	58 1/4	12	1,398	8,260	6,190	4,250	3,380	2,220	
28	TD-9	114	73 7/8	75 1/8	60	11,120	10 1/8	Clutch	85	7,221	54.5	62		33	63 1/16	13	1,640	11,160	7,850	5,530	4,160	2,850	
29	TD-14	140 3/4	78 13/16	91 1/8	74	20,000	11 3/4	Power Assist	104	11,395	78.5	89.5		36	78 7/16	16	2,510	16,500	12,400	9,320	7,100	5,120	3,650
30	TD-18	166 1/4	84 3/4	94	74	28,490	14		109	15,681	103	117		40	94 5/8	20	3,820	24,300	18,290	14,500	10,860	7,920	6,100 (f)
31	TD-24	182 1/4	96 3/4	102	80	40,670	13 7/8	Planet Power	118	22,850	161			39	104 1/2	22	4,598	37,160	28,490	23,415	18,180	13,125	9,690
32	TD-24 TC	182 1/4	96 3/4	102	80	40,375	13 7/8		118	25,145			200	39	104 1/2	22	4,598			Torque Converter			
33	AGRICAT (Joest Mfg. Co.) F1	58	41	38	6	1,160	12	Clutch	62	$1,114	5			26	40	6	480	1,000(a)	(a) 960				
34	F1.5	58	41	38	6	1,270	12		62	1,260	5 1/2			30	38	6	456	1,150	1,050				
35	FD	58	41	38	6	1,475	12		62	2,995	5	7		26	40	6	480						
36	OLIVER OC-3	100	50 3/8	52 5/16	42	3,862	20	Controlled Differential	91	$2,565	21.8	26.3		30	50	10	1,000	3,940	2,512	1,472			
37	OC-6 G	121 1/2	56 1/4	56 1/4	42	5,565	20		89	3,681	32.9	37.9		33	54 1/8	8	866	6,215	4,681	3,426	2,532	1,990	897
38	OC-6 D	121 1/2	56 1/4	56 1/4	42	5,705	20		89	4,323	34.7	37.4		33	54 1/8	8	866	6,779	5,204	3,708	2,729	2,104	922
39	AD	101 1/2	54	58	42	7,411	13 1/2		95	5,247	30.5	38		29	62	12	1,488	6,500	4,520	2,800			
40	AG-6	103 1/2	54	58	42	8,012	13 1/2		95	4,284	30.6	38.8		29	62	12	1,488	6,020	4,160	2,640			
41	OC-12 G	189 7/8	57 3/4	58	44	10,585	11 3/4	Power Turn	91	5,771	53.14	60.27		33	71 1/16	14	1,990	10,399	7,831	5,322	3,161		
42	OC-12 D	189 7/8	57 3/4	58	44	10,935	11 3/4		91	6,777	53.05	58.98		33	71 1/16	14	1,990	11,330	8,310	5,708	3,391		
43	DCH	138	67	82	61	13,457	12 1/4	Controlled Differential	130	7,310	60.47	71.4		31	76 1/4	16	2,440	14,582	9,362	7,188	3,964		
44	DDH	139	67	82	61	14,176	12 1/4		130	9,160	60.47	74.43		31	76 1/4	16	2,440	14,735	9,632	7,277	3,978		
45	OC-18	167	83	111	78	33,300	16 7/16	Power Turn	114	21,271	133	149		35	100	22	4,411	31,030	18,510	11,770	6,880		

(a) Not tested at Nebraska
(b) Five-roller mount: 35 shoes; ground contact, 1328 sq. in.; turning radius, 78 in.; length, 66 in; weight, 4,822 lb; $2,845, fob factory
(c) Available with Eimco air-powered motors ($5,670, fob factory) or AC electric motors ($7,100, fob factory)
(d) Available with 4 cycle, 125-hp Cummins diesel ($16,500,fob, factory)
(e) Twin power units. Listed capacity specifications for each engine. Transmission capacity includes torque converter, bevel gear and brake compartments
(f) 7th gear: 6.3 mph, 7,320 dbpp; 8th gear: 8 mph, 5,490 dbpp
(g) Includes planet housing
(h) Included in transmission column
* Revisions Being Considered

CONSTRUCTION
METHODS
AND EQUIPMENT

A CM&E Feature

MAX. TRAVEL SPEEDS, MPH								ENGINE							BELT PULLEY			LIQUID CAPACITIES				
1st	2nd	3rd	4th	5th	6th	Reverse, Low	Reverse, High	Make	Model	Diesel or Gas	No. of Cylinders & Bore & Stroke	Cycle	RPM at Gov. Speeds	Starting Method	Diameter, In.	Face, In.	RPM, Normal	Cooling System, Gal.	Fuel Tank, Gal.	Crankcase, Qts.	Transmission, Qts.	Final Drive, Qts.	
1.5	2.4	3.3	4	5.5		2		Allis-Chalmers	HD-334	D	4 7/16 x 5 9/16	4	1800	Electric	12	8 3/4	963	6 1/2	40	10	20	12	1
1.4	2.1	2.9	3.8	4.4	5.7	1.6	4.4		HD-516	D	4 7/16 x 5 9/16	4	1800		13 3/8	10	1,045	10	60	15	27	13	2
1.4	2.1	3	3.9	4.5	5.8	1.5	4.5		HD-M44	D	5 1/4 x 6 1/2	4	1600		18	15	693	15 3/4	100	24	34	22	3
0-2.5	0-4.3	0-7.2				0-3.2	0-5.5		HD-M44	D	5 1/4 x 6 1/2	4	1800		18	15	693	17	100	24	32	22	4
0-3	0-7.5					0-5.5			HDT-4M4	D	5 1/4 x 6 1/2	4	1800		20	15	780	20	135	24	39	30	5
1.74	2.75	4.52				2.01		Continental	F-140	G	3 3/16 x 4 3/8	4	1850	Electric	8 1/2	6 1/2	535	2 1/2	10	4	8	2 1/2	6
1.74	2.75	4.52				2.01			F-162	G	3 7/16 x 4 3/8	4	1850		8 1/2	6 1/2	535	3 1/2	10	4	8	2 1/2	7
1.74	2.75	4.52				2.01			F-162	G	3 7/16 x 4 3/8	4	1850		8 1/2	6 1/2	535	3 1/2	18	4	8	2 1/2	8
1.74	2.75	4.52				2.01			GD-157	D	3 3/8 x 4 3/8	4	1850		8 1/2	6 1/2	535	3	18	4	8	2 1/2	9
0-1.88	0-2.97	0-4.88				0-2.17			FA-162	G	3 7/16 x 4 3/8	4	2250		8 1/2	6 1/2	535	3 1/2	18	4	8	2 1/2	10
0-1.88	0-2.97	0-4.88				0-2.17			GD-157	D	3 3/8 x 4 3/8	4	2250		8 1/2	6 1/2	535	3	18	4	8	2 1/2	11
0-1.94	0-3.43	0-3.97	0-6.98			0-2.13	0-7.68		F-209	G	3 3/16 x 4 3/8	4	2250					4	25	5	28	3	12
0-1.94	0-3.43	0-3.97	0-6.98			0-2.13	0-7.68		ED-208	D	3 11/16 x 4 7/8	4	2250					4	25	11	28	3	13
1.8	2.7	3.2	3.9	5.5		2.2		Caterpillar	D-311	D	4 x 5	4	1650	Gasoline Engine With Electric Starter	12	7 1/2	1001	7 1/2	26	14	8	4 1/2	14
1.9	2.7	3.4	4.2	6.1		2.2	6.1		D-315	D	4 1/2 x 5 1/2	4	1600		12	8 1/2	960	11	30	15	18	7	15
1.7	2.6	3.6	5.	6.6		2.2	6.2		D-318	D	4 1/2 x 5 1/2	4	1600		13 1/8	13	896	14 1/2	48	22	42	13	16
1.5	2.2	3.2	4.6	5.9		1.8	6.4		D-339	D	5 3/4 x 8	4	1000		17 5/8	15	832	17	85	22	43	23	17
1.5	1.9	2.8	3.8	5.2		2.0	3.8		D-342	D	5 3/4 x 8	6	1200		14 7/16	15	1015	25	118	34	35	20	18
L-0-3.6, Int.-0-5.3, H-0-7.4						Same as Forward			D-342	D	5 3/4 x 8	6	1200		14 7/16	15	1015	25	118	34	31	20	19
1.6	2.1	2.8	3.8	5	6.7	1.6	6.7		D-9	D	6 1/4 x 8	6	1200					35	157	36	52	54	20
L-0-4.1, Int.-0-5.8, H-0-7.8						Same as Forward			D-9	D	6 1/4 x 8	6	1200					35	157	36	52	54	21
.82	2.2	2.95	5.3			1.63		Deere	420	G	4 1/4 x 4	2	1850	Elec.	9	6	1270	2 3/4	10 1/2	5	6 1/2	1 3/4	22
0-1.5						0-1.5		Eimco		(c)	-		750								70		23
0-2.25	0-5.5					0-2.25	0-5.5	(d) GM	4080	D	4 1/4 x 5	4	1800	Elec.				7 1/2	60	17	128	136	24
1.7	3.5	8.3				Same as Forward		GM-6-71 (Two Engine)		D	6 1/4 x 5	2	1800	Elec.				(e) 19	84 1/2	20	(e) 140	36	25
1.6	2.3	3.3	4	5.7		1.8	3.9	International	264	G	4 x 5 1/4	4	1550	Electric	12 1/8	8 1/2	925	9	33	9	16	1	26
1.6	2.3	3.3	4	5.7		1.8	3.9		264	D	4 x 5 1/4	4	1550		12 1/8	8 1/2	925	10	33	9	16	1	27
1.7	2.5	3.4	4.3	5.9		1.9	3.9		350	D	4 1/2 x 5 1/2	4	1550		11	8 1/2	973	12	33	11	22	1 1/2	28
1.7	2.3	2.9	3.7	4.8	6.3	1.8	3.7		461	D	4 3/4 x 6 1/2	6	1650		11 3/4	11	1030	11	61	18	24	7 1/2	29
1.6	2.1	2.6	3.4	4.5	5.5	1.6	3.4		691	D	4 3/4 x 6 1/2	6	1450		11 3/4	11	906	15	75	26	30	10	30
1.6	2.1	2.5	3.2	4.2	5.4	1.6	(f) 7.8		1091	D	5 3/4 x 7	6	1400					38	135	30	(g) 192	21	31
0-2.7	0-3.5	0-6.1	0-7.6			0-2.8	0-6.6		1091	D	5 3/4 x 7	6	1500					40	135	30	(g) 192	21	32
1.75	3					2.25		Briggs & Stratton	23	G	3 x 3 1/4	1	3200	Rope				Air	1 1/2	2	1/2 Pt	1/2 Pt	33
1.75	2					2.25			23	G	3 x 3 1/4	1	3200	Rope				Air	1 1/2	2	1/2 Pt	1/2 Pt	34
1.75	3					2.25		Hallett	AC-1	D	3 1/2 x 3 5/8	1	2200	Elec.				Air	2 1/2	2 1/2	1/2 Pt	1/2 Pt	35
2.01	3.19	5.75				2.33		Herc.	IXB3	G	3 1/4 x 4	4	1700		8 1/2	6 1/2	1038	3 3/4	12	5	8	1 1/2	36
1.88	2.44	3.23	4.19	5.15	8.85	1.92	3.31	Oliver	OC6	G	3 5/16 x 3 3/4	6	1600					4 1/4	16 1/2	7	22	9	37
1.88	2.44	3.23	4.19	5.15	8.85	1.92	3.31	Oliver	OC6	D	3 5/16 x 3 3/4	6	1600					4 1/4	16 1/2	7	22	9	38
1.78	2.62	3.74				1.36		Herc.	DOOC	D	4 x 4 1/2	4	1530	Electric	10 1/2	8 1/2	1130	5 1/2	18	13	40	(h)	39
1.78	2.62	3.74				1.36		Cont.	F226	G	3 5/16 x 4 3/8	6	1530		10 1/2	8 1/2	1130	5	18	8	40	(h)	40
1.6	2.34	3.34	5.27			1.72	3.6	Hercules	JXLD	G	4 x 4 1/2	6	1750		12	8 1/2	1034	6	35	7	32	16	41
1.6	2.34	3.34	5.27			1.72	3.6		DJXC	D	3 3/4 x 4 1/2	6	1750		12	8 1/2	1034	6	35	12	32	16	42
1.45	2.28	3.04	4.85			1.72	3.62		RXC	G	4 3/8 x 5 1/4	6	1300		11	11	958	10 1/4	30	13	52	(h)	43
1.45	2.28	3.04	4.85			1.72	3.62		DRXB	D	4 3/8 x 5 1/4	6	1300		13	13	958	10 1/2	30	20	52	(h)	44
1.5	2.61	3.76	5.45			1.83	3.53		DFXE	D	5 5/8 x 6	6	1500					15 1/2	66	34	144	48	45

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.
American Tractor Co., Churubusco, Ind.
Caterpillar Tractor Co., Peoria, Ill.
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The Eimco Corp., Salt Lake City, Utah
Euclid Div., General Motors Corp., Cleveland 17, Ohio
International Harvester Co., 180 W. Michigan Ave., Chicago, Ill.
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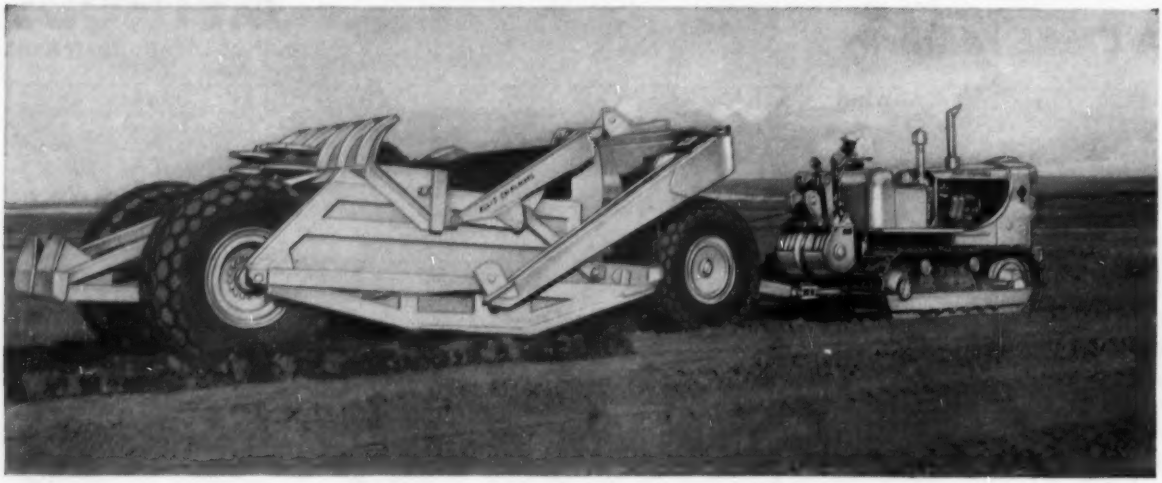


Allis-Chalmers HD-16 crawler tractor and 315 pull scraper

Teamed to increase output ...keep jobs on the move

Here's more of everything you want in a tractor-scraper team ... a combination of advanced basic design features that cut cost and time per yard.

The HD-16 has an all-steel box-A main frame that absorbs shocks and protects the power train. A powerful Allis-Chalmers diesel engine and your choice of either torque converter or standard transmission drive, give you plenty of work power for big jobs. And with 1,000-hour lubrication intervals for truck wheels, idlers and support rollers, even under severe conditions, you can eliminate daily greasing . . . convert maintenance time into production time.

With its wide, low bowl and offset cutting edge, the 315 scraper makes effective use of the HD-16's power to get heaping, void-free loads. Wheels are inside the cutting edge for smooth loading . . . and loaded weight is equally distributed on all four wheels for fast hauling, long tire life.

This earth-moving team can give you big output plus real dependability. Let your Allis-Chalmers construction machinery dealer show it to you now.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIV., MILWAUKEE 1, WIS.

ALLIS-CHALMERS

HD-16

with hydraulic torque converter drive
150 net engine hp
31,600 lb

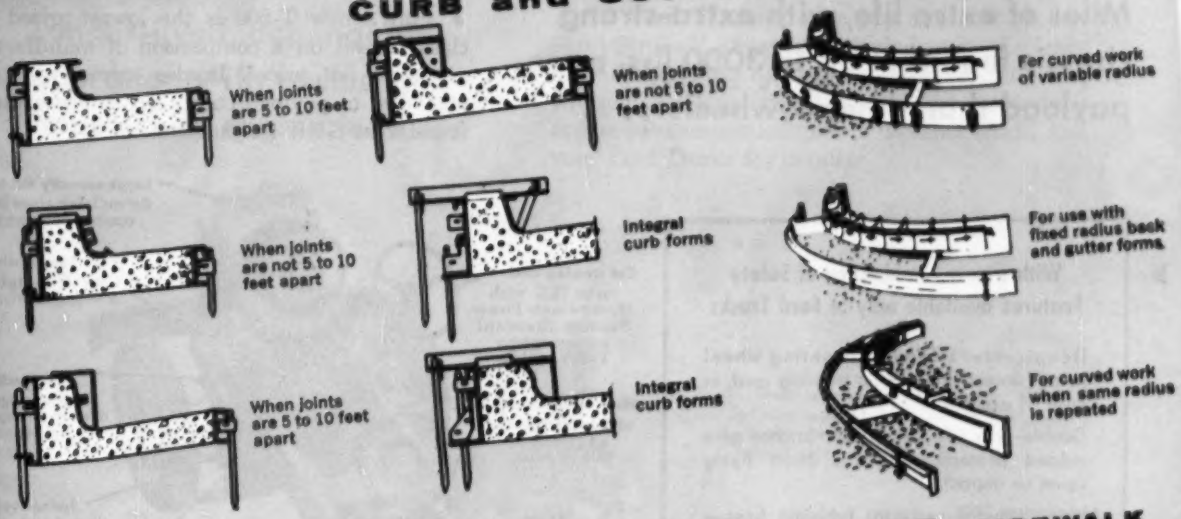
with standard transmission
141 belt hp
31,500 lb

AC-315

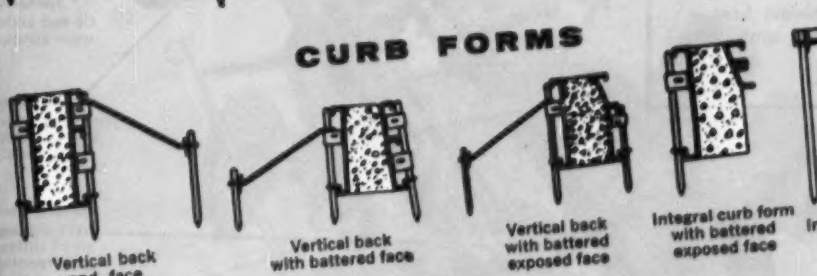
15 cu yd struck
20 cu yd heaped
25,850 lb
cable-controlled

15 ways to save time and materials on curb, gutter and sidewalk jobs...

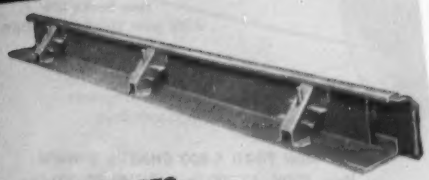
CURB and GUTTER FORMS


When joints are 5 to 10 feet apart
When joints are not 5 to 10 feet apart
For curved work of variable radius
When joints are not 5 to 10 feet apart
Integral curb forms
For use with fixed radius back and gutter forms
When joints are 5 to 10 feet apart
Integral curb forms
For curved work when same radius is repeated

CURB FORMS


Vertical back and face
Vertical back with battered face
Vertical back with battered exposed face
Integral curb form with battered exposed face
Integral curb form with battered exposed face

SIDEWALK FORMS



SAVE COSTS WITH ROAD FORMS

Self-aligning road forms save time and expense on highway paving, too. They will assure you of rapid form setting always true to line and grade. Road forms are available in heights of 8" or more and Airport forms in heights of 12" or more.

BLAW-KNOX

This "Complete Package" of forms can be used over-and-over again to build any of the cross sections shown above and *build them faster at a lower cost.* If curb, gutter and sidewalk building is part of your business, you can save time and material expense with these Blaw-Knox Universal steel forms. They are the only *completely standardized* forms that can be used interchangeably on many different jobs so you can take on a wide range of jobs with a low investment in forms. They are self-aligning, easy to set and strip and practically eliminate hand finishing. For complete details, see your Blaw-Knox distributor.

BLAW-KNOX COMPANY

CONSTRUCTION EQUIPMENT DIVISION

38 Charleston Avenue, Mattoon, Illinois

NOW! The lowest-priced

Miles of extra life, with extra-strong chassis features! Up to 3000 lbs. more payload than other 6-wheelers!

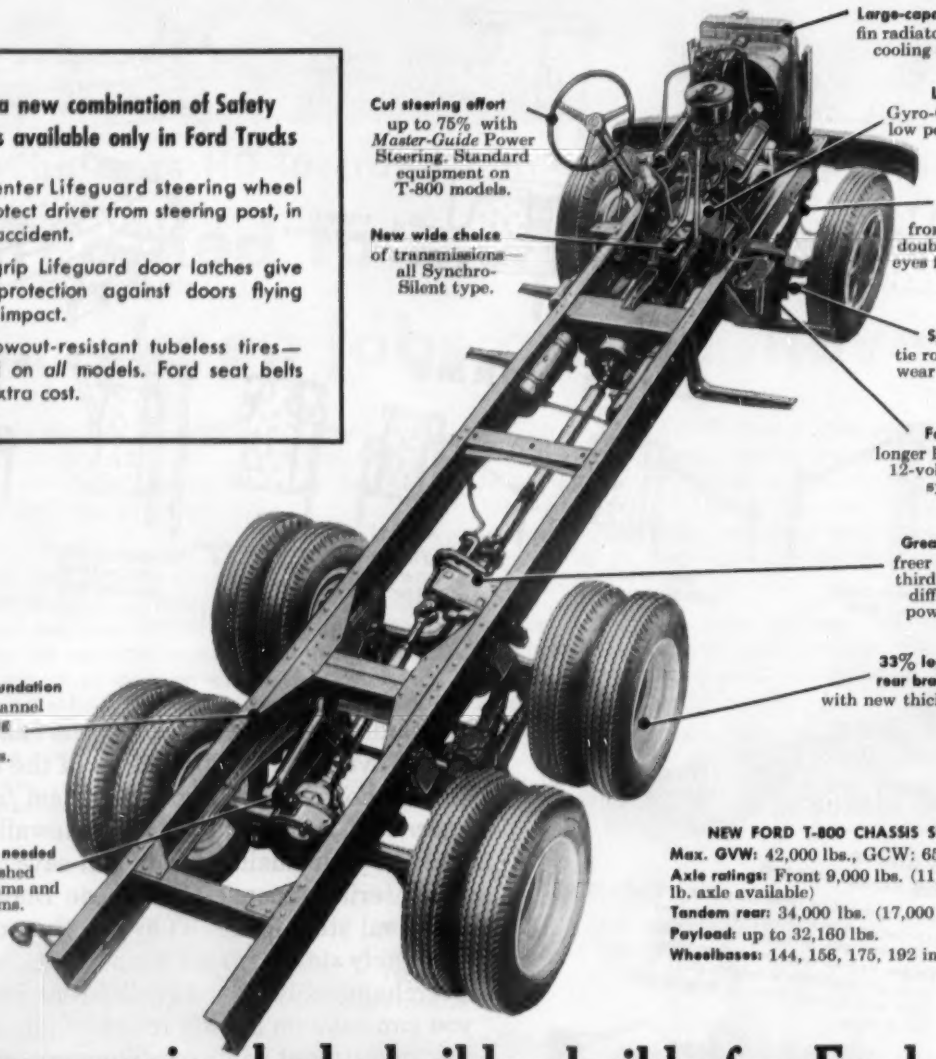
• Ford's new T-800 is the lowest-priced in its class—based on a comparison of manufacturers' suggested list prices. It also carries up to 3000 more lbs. of payload compared to other tandems *in the same GVW weight class!*

With a new combination of Safety Features available only in Ford Trucks

Deep-center Lifeguard steering wheel helps protect driver from steering post, in case of accident.

Double-grip Lifeguard door latches give added protection against doors flying open on impact.

New blowout-resistant tubeless tires—standard on *all* models. Ford seat belts at low extra cost.



Large-capacity flat tube fin radiator gives high cooling efficiency.

Long lasting Gyro-Grip clutch with low pedal pressure.

Cut steering effort up to 75% with *Master-Guide* Power Steering. Standard equipment on T-800 models.

Easy-action front springs with double-wrapped rear eyes for added safety.

New wide choice of transmissions—all Synchro-Silent type.

Spring-loaded tie rod ends take up wear automatically.

Faster starts, longer life with new 12-volt electrical system.

Greater economy, freer rolling, from third (inter-axle) differential in power divider.

33% longer rear brake life with new thicker linings.

Rugged truck foundation from deep-channel frames, among the strongest on any trucks.

No lubrication needed —rubber-bushed equalizing beams and torque arms.

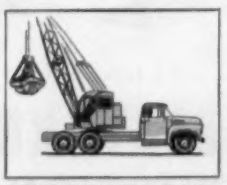
NEW FORD T-800 CHASSIS SHOWN
Max. GVW: 42,000 lbs., GCW: 65,000 lbs.
Axle ratings: Front 9,000 lbs. (11,000 lb. axle available)
Tandem rear: 34,000 lbs. (17,000 each axle)
Payload: up to 32,160 lbs.
Wheelbases: 144, 156, 175, 192 inches.

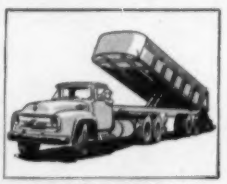
Every major body builder builds for Ford . . .

CEMENT MIXER TRUCK

DUMP TRUCK

DUMP WITH SCRAPER

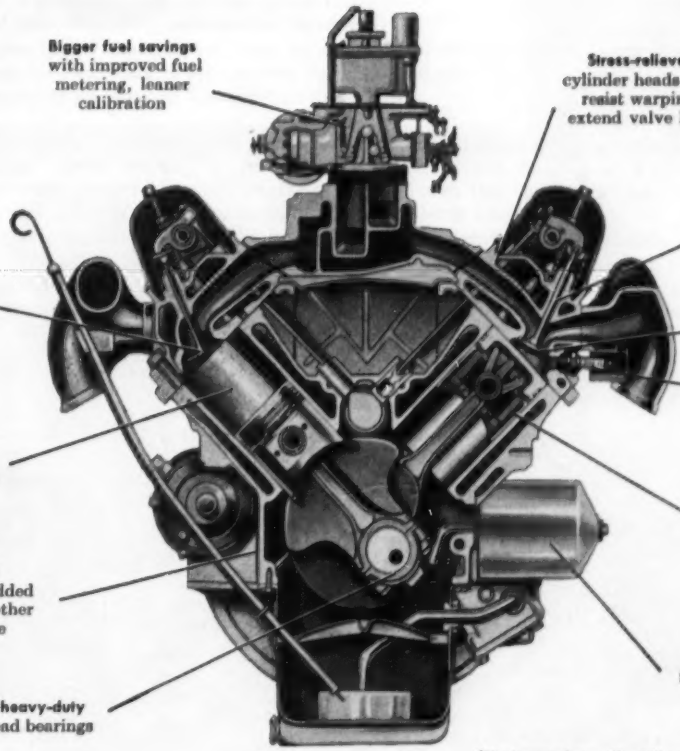

TRUCK-MOUNTED CRANE


TRAILERIZED DUMP

Tandem in its class-Ford T-800

Longer-lived, dependable operation with exclusive heavy-duty engine features

• '56 Ford Tandems offer you the most proven Short Stroke V-8 engines in the industry—*for better gas mileage, longer life, less maintenance costs.* And you get a combination of longer-lasting heavy-duty engine advancements found in no other truck. Ask your Ford Dealer for details.



Bigger fuel savings with improved fuel metering, leaner calibration

Stress-relieved cylinder heads that resist warping, extend valve life*

225° cooler valves —new sodium-cooled exhaust valves with tungsten-cobalt facing*

Self-Sealing dish-type intake valves for tighter fit*

Durable, self-cleaning free-turn valves

Anti-fouling 18-mm. spark plugs with new long-life electrodes

Short Stroke design in *every* engine for greater gas savings, longer life

Expansion-controlled pistons with integral steel struts

Deep-block structure for added strength, smoother performance

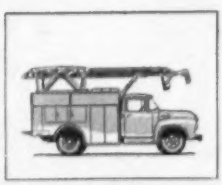
Full-flow oil filter to clean *all* the oil for longer engine life

Durable heavy-duty copper-lead bearings

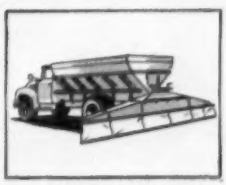
***Features of new Ford Heavy Duty engines . . .** 190-h.p. *Torque King* V-8 shown . . . 200-h.p. *Torque King Special* V-8 available.

More fleets are buying Fords than any other make

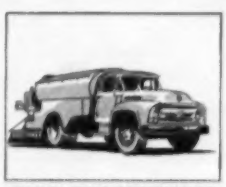
UTILITY TRUCK



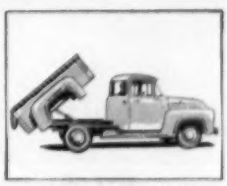
LINE TRUCK



LIME SPREADER



BITUMINOUS DISTRIBUTOR



LIGHT DUTY DUMP

Japanese Dam Rises Across Deep Canyon

SAKUMA DAM goes up fast as swift-flowing Tenryu River is by-passed through twin diversion tunnels 2200 ft long. Intake structure, cableways, and concrete batch plant cling to steep valley walls.

A SPECTACULAR DAM towering 504 ft above Japan's jagged Tenryu River valley is rapidly nearing completion. Aided by dam experts of California's Guy F. Atkinson Co., a Japanese force is winding up three years' work with an impressive array of tunneling and concrete placing records.

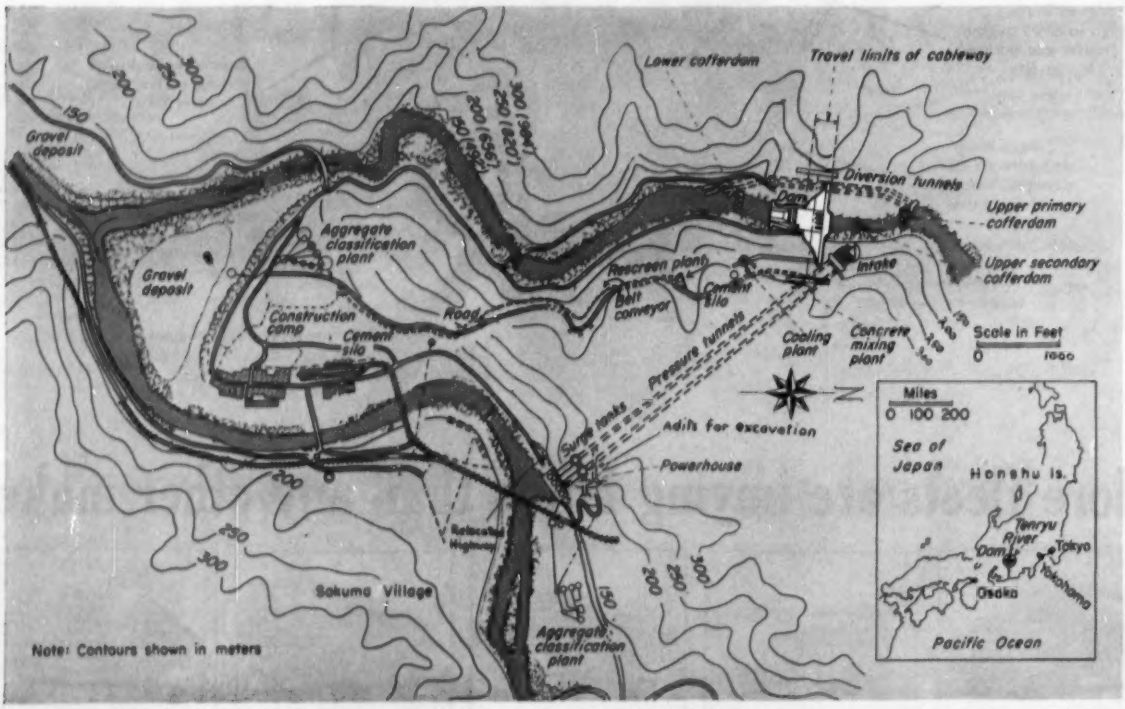
It is a mammoth job. More than 2,000,000 yd of concrete were placed in the 965-ft-long structure by a pair of 25-ton cableways. Production averaged 100,000 yd a month.

Aggregate handling was unique. Excavated from a wide area downstream, river-run gravel travelled on miles of conveyors through long tunnels and up steep hills. The final conveyor plunged through the side of a mountain, terminating over the huge batch plant perched on a steep cliff overlooking the dam.

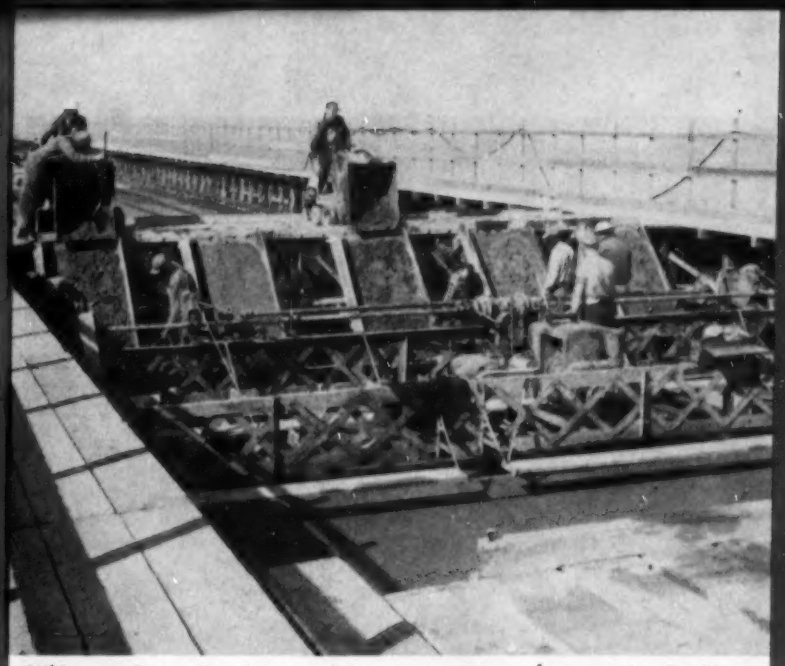
Tunnel production edged close to a new world's record. On one 37-ft diversion tunnel, the Japanese removed 30,810 cu ft of rock in one day. Production per driller averaged 2,055 cu ft per day.

During the first year, activity centered about diversion tunnels, access roads, temporary bridges, and new railroad spurs. Because of the rugged terrain, many roads had to be chiseled out of sheer valley walls. In fact, a high level access road leading to the batch plant and cableways required seven separate tunnels totalling 3,800 ft.

(Continued on page 127)



RUGGED TERRAIN complicates construction of high dam. Note difficult route of long belt conveyor from aggregate plant to batch plant.



Whiteman Power Buggies speed concrete out ramp on one side of Bridge—return on opposite ramp for next load. Keep pouring operation moving at a fast pace. These photographs courtesy of Construction Illustrated.

Whiteman

Power Buggies* make SHORT WORK of a LONG HAUL

on ¼ mile ramp on San Francisco Bridge†

Whiteman Power Buggies load from truck mixers a quarter mile from pouring site.

Cross-ramps for pouring operations handle five Power Buggies at one time.

Whiteman Power Buggies haul materials too! Here a load of forms is moved to a new location.

Pouring 14,200 cu. yds. of concrete decking on the Richmond-San Rafael Bridge crossing San Francisco Bay requires carrying concrete over a ¼ mile long ramp from truck-mixer to pouring site. This long haul would have been a slow, back-breaker with hand buggies, but fast, efficient Whiteman Power Buggies placed the concrete in record time.

Whiteman Power Buggies are gluttons for work — never tire or slow down. Their versatility and performance will keep your concrete-placing operations moving on a fast schedule. You'll find Power Buggies priced to quickly pay for themselves . . . often on their first job. Call your Whiteman Distributor today . . . or send coupon below for complete details.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

TRUCK MIXERS

POWER BUGGIES

VIBRATORS

SCREEDING MACHINES

FLOATING-FINISHING MACHINES

WHITEMAN MANUFACTURING CO., DEPT. C
13020 Pierce St., Pacoima (L.A.) Calif.

Please send prices, catalogs and name of distributor for
☐ Power Buggies ☐ Screeding Machines ☐ Vibrators
☐ Floating-Finishing Machines ☐ Truck Mixers.

Name .....

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City ..... Zone ..... State .....

MARION operators *ride on air*

. . . . . well, it's <u>almost</u> like riding a cloud when Marion Air Control takes the heavy push and pull out of shovel running. You control main machine motions with a maximum of only 12 pounds hand pressure. You can inch the load or hold it with simple wrist pressure. Operators stay fresh and fast all shift long. Cycle time is shortened without extra effort. Machinery lasts longer. Marion <u>engineered</u> air control has thoroughly proved its value in the field; requires minimum maintenance. Ask your Marion distributor what it can mean on your work. Your output rises when your operator rides on air.

MARION POWER SHOVEL COMPANY
MARION, OHIO

SAKUMA DAM . . .
Continued from page 124

Tunneling

One of the first big operations was driving twin diversion tunnels. The 2200-ft tubes, 37 ft in dia, were bored in only a few months.

A four-deck steel jumbo with 15 hydraulically operated booms mounting Gardner-Denver drifters drilled blast holes. On a full face heading, about 76 holes 15 ft deep were drilled per shot. Dynamite factor was 1¾ lbs of 28% ammonia blasting gelatin per yd of rock.

Sixty-pound rails, spaced 14½ ft apart, provided the necessary track for withdrawing the jumbo from the heading during blasting and mucking. Special collapsible deck sections allowed the shovel and trucks to pass through.

A pilot drift at the top of each tunnel, driven ahead of the full-face operations, eliminated the need for special ventilating equipment and permitted scaling of the roof after blasting.

The average daily advance per heading was 18 ft in the east tunnel and 21 ft in the west tunnel. A production of 30 ft in a 24-hr period was achieved in the west tunnel for seven consecutive days. This is a remarkable record considering that full face excavation in tunnels this size had never before been attempted in Japan.

Excavation

Foundation excavation was completed in excellent time. In fact, more than 500,000 cu yd extending 75 feet below the river bed was removed in 150 days, even though 17 days were lost due to flooding.

It was tough work.

Because of the steepness of the left abutment, much of the excavation from the upper access road and cableway sites fell into the river bed, increasing the amount of work that had to be done to reach bedrock.

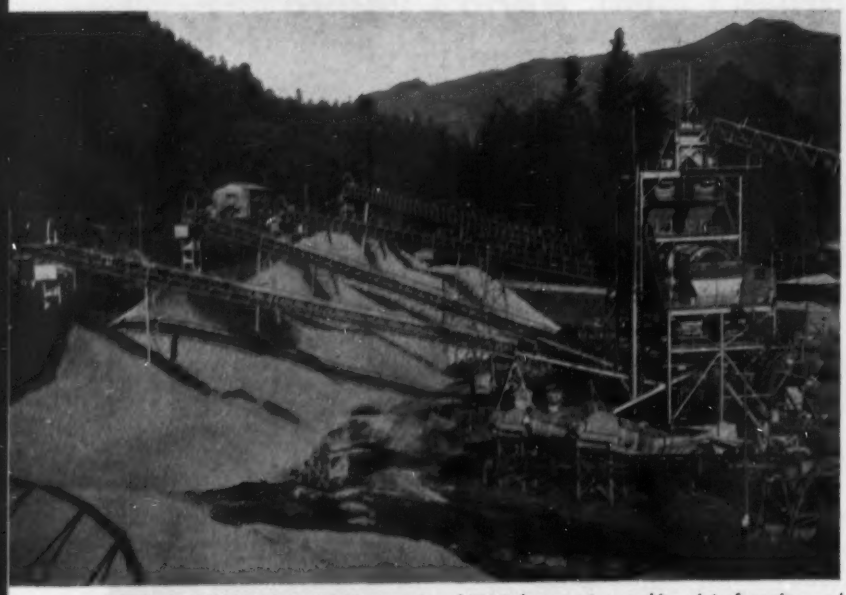
Conventional high scaling, drilling, and blasting methods were employed on the higher abutment elevations and above the crest of the dam. Whenever working room permitted, wagon drills were used and benches were cleared of muck with a dozer.

Disposal areas were very limited because of the narrow canyon at the dam site. It was necessary to build waste dumps against the sides of the canyon and haul the material up slopes of nearly 20%.

(Continued on next page)

Drillers Near World's Record on Diversion Tunnels

DUMP TRUCK carrying load of muck passes through opening in huge jumbo mounting 15 Gardner-Denver drills. Average daily advance in 37-ft tunnels is 20 ft, but some days recorded as much as 30 ft. Best day's production is 30,810 cu ft which is probably close to world's record. Muck is excavated, below, by Bucyrus-Erie 2-yd shovel equipped with shortened boom and exhaust scrubbers. Little concrete lining is required.



MAIN SCREENING PLANT with capacity of 700 tph separates crushings into four sizes and stockpiles them over 8-ft reclaiming tunnel. Sand is processed at adjoining plant.

VEHICLE TRAFFIC and main aggregate conveyor both move through access tunnels. Seven such tunnels totalling nearly 3,800 ft carry high-level road to concrete batch plant.

FLEET of big American rigs cleans up bedrock for dam foundation. Two Bucyrus-Erie 54B's load 12-yd Euclid dump trucks. More than 500,000 yd were removed in 150 days.

The average length of haul to the disposal areas was ¾ mi. Constant planning assured adequate access in the foundation area as the excavation deepened.

During the period when the greatest amount of material was being removed, major equipment included three 2½-yd Bucyrus-Erie 54B's, one 2½-yd Bucyrus-Erie (backhoe) 54B, and one 2-yd Marion 372. Also, there were three D-8 Caterpillar dozers, and twenty-seven 12-yd Euclid trucks.

Concrete Placing

Two 25-ton moveable cableways mounted on parallel tracks 393 ft long handled most of the concrete placing. The span length of the 3½-in. dia main cable was 1,265 ft. Complete coverage of 86% of the mass concrete area was possible without the use of a drifting line. The remaining concrete in the stilling basin and apron section was placed by means of a fixed 15-ton cableway, a moveable 4½-ton cableway, and by attaching a drifting line to the bucket on the 25-ton cableway.

The two main cableways were identical except for hoisting equipment. One had a conventional Lidgerwood 3-drum hoist powered with a 500 hp ac motor. The other permits simultaneous traveling and lifting of the load. It is powered with four General Electric 425 hp dc motors and has Amplidyne controls. A remarkable speed record was set in January when the two cableways placed 6,775 yd of concrete in a 24-hr period. The previous record was achieved with these same cableways in June, 1952, at Pine Flat Dam in California.

Batching Plant

The batching plant also was transplanted from the Pine Flat project, where it had handled over 2,100,000 yd of concrete.

Mixing was accomplished by four 112S Smith mixers which discharged into separate holding hoppers. To fill the transfer car, the operator emptied two of the 4-yd holding hoppers by pulling bell cords which operate air valves controlling the bottom radial gates.

Gravel bins for the 6-in., 3-in., 1½-in., and ¾-in. sizes were precooled by four Joy fans. A 10-in Fuller-Huron Air-Slide delivered cement from a nearby 300-ton silo to a storage bin within the batch

(Continued on page 131)

COMPETITIVE TESTS SHOW EIMCO ADVANTAGES

Recent competitive tests have shown again the superiority of Eimco equipment.

Tests conducted in timber and foothill brush were made to determine dozer earth moving and fire line construction ability.

Over a five day period numerous runs were made by impartial crews and judges with experienced operators using an Eimco 105 and a conventional tractor both equipped with bulldozers.

When final results were computed, the Eimco rated "Best" with 33% more dozer earth moving and 11% more fire line construction and the Eimco had also earned operator confidence because it was more stable, easier to operate and would back up 30% steeper grade (the usual method of getting out of trouble).

The features on the Eimco that contributed to its success in the test and outstanding performance under most difficult conditions were: front operator position, better visibility, rear engine mounting, better weight distribution, torque converter, better location and protection of cooling system, better maneuverability (through independent track control) simple controls which eliminate clutch pedals, steering clutch levers, master clutch and manual gear shift lever.

Eimco tractors with bulldozer or excavator attachments are demonstrating their superiority of performance and economy of operation on highways, construction jobs, in mines and in numerous other applications. See the Eimco Tractor before you make any decision on new equipment.

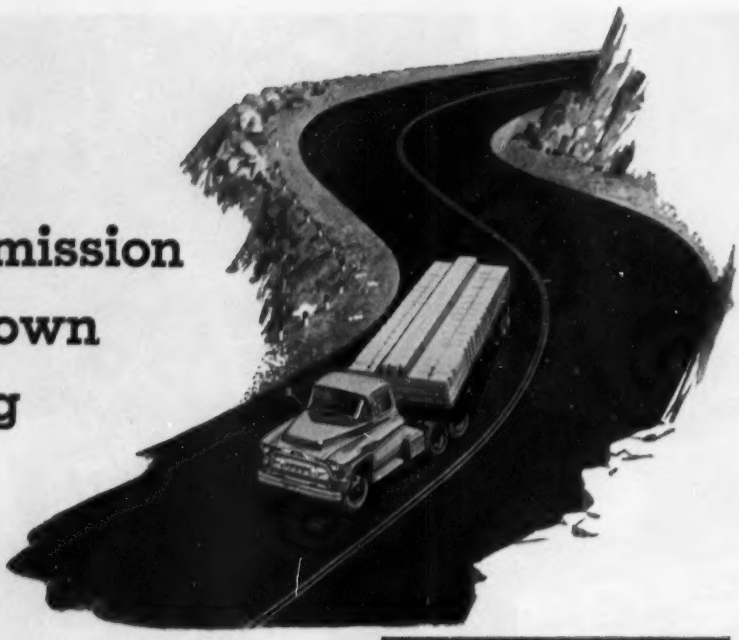
THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-502

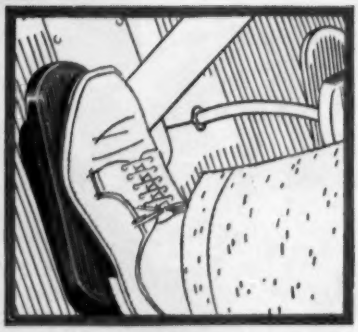
New 6-speed automatic transmission lets you slow down without touching the brake!



This is just one of the remarkable advantages you get in *Powermatic* . . . a completely new heavy-duty automatic transmission offered exclusively in new Chevrolet Task-Force trucks.

Now Chevrolet brings you exclusive *Powermatic*—the first automatic transmission designed especially for heavy-duty trucks! Unlike conventional or semi-automatic transmissions, *Powermatic works for you all the time.* Six fully automatic forward speeds and a torque converter virtually eliminate manual gear shifting on hills! A revolutionary "retarder" assures safer downhill hauling, far less brake wear. Furthermore, *Powermatic* is designed to aid top-notch economy on the highway . . . and you'll make better time through traffic because all shifts are "power-on" shifts!

For all the facts about the biggest improvement in heavy-duty hauling in *many* years—exclusive *Powermatic* — see your Chevy dealer soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.



With exclusive *Powermatic* Retarder most hills can be descended without touching the brakes . . . and most normal slowdowns can be made by the Retarder alone!

New *Powermatic* transmission* is just one of the many ultra-modern features you'll find in the all-new line of Chevrolet heavy-duty trucks! There's a new 195-hp Loadmaster V8 . . . new Triple-Torque Tandem options with G.V.W.'s up to 32,000 lbs., G.C.W.'s up to 50,000 lbs. . . . new 5-speed Synchro-Mesh transmission!** No other big trucks offer so many up-to-the-minute engineering advancements!

**Optional at extra cost in 5000 through 10000 Series models.*

***Standard in Series 9-10000 models, optional at extra cost in Series 5000, 6000, 7000, 8000 models.*

CHEVROLET

New Chevrolet Task·Force Trucks

Anything less is an old-fashioned truck!

SAKUMA DAM . . .
Continued from page 128

plant. Bulk cement was hauled by truck 2 mi from a 4,000-ton storage plant.

Transfer Cars

To handle 8-yd Gar-Bro concrete buckets, a fast dumping transfer car discharged concrete through a side-mounted chute extending from a hopper that emptied as it rolled on a rack and pinion. The car traveled on a standard gage track with power furnished through a flexible drag cable riding in a rubber-lined trough of special design. A second car served as a standby unit.

Cooling Plant

Specifications for mass concrete required a placing temperature of 55.4 deg F. They also called for in-place concrete cooling by means of water circulating through embedded piping in the lower third of the dam.

To meet these requirements, a plant was built to deliver cold air, chilled water, and ice. It consisted of four separate ammonia refrigeration systems, three of which produce chilled water and the fourth, tube ice. A closed-type circulating air sytsem permitted cold air to be forced through the aggregates in the batch plant storage bins for precooling. During the summer, about 40% of the mixing water was added in the form of tube ice.

Aggregate Production

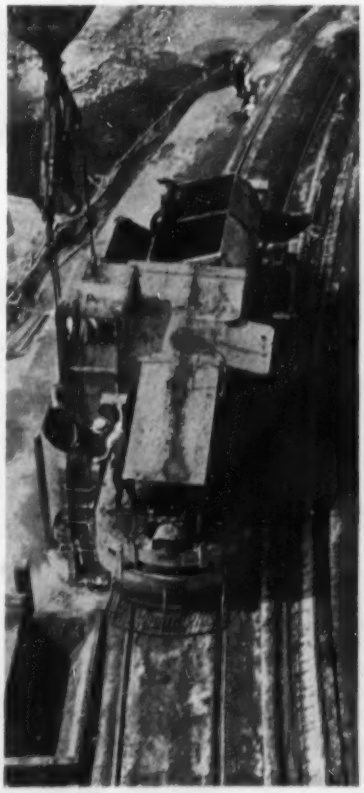
The aggregate source for the project was 1½ mi downstream from the dam. It was a natural deposit of river run gravel covering about 98 acres. Much of this area was covered with a heavy layer of sand and silt which varied from two to 20 ft in depth. This condition required a certain amount of stripping and a constant blending of materials in the pit to yield a product which was economical to handle and process.

Gravel above the ground water level was excavated with 2½-yd shovels and loaded into Euclid trucks to be hauled and dumped directly into a grizzly hopper. An over-abundance of sand made it necessary to obtain gravel below water level from the river bars. This was done with a 2-yd backhoe.

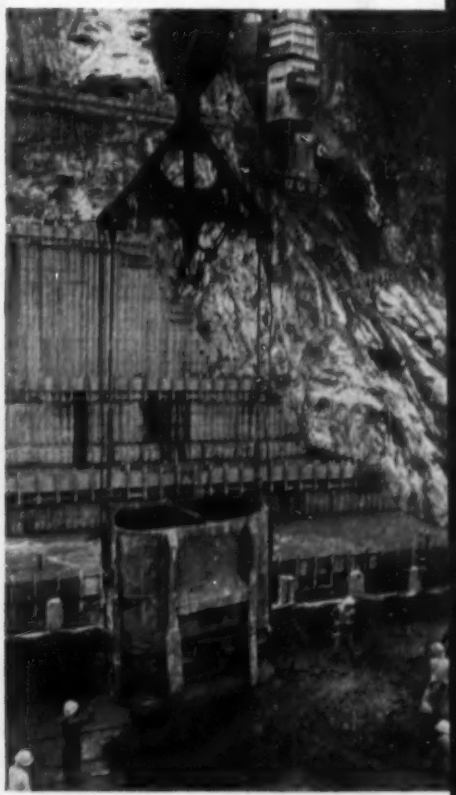
The bars of the grizzly hopper were set to give a clear opening of 20 in. The material passing this

Two Cableways Place 100,000 yd a Month

BATCH PLANT perched on steep cliff is fed by aggregate conveyor that runs through mountain tunnel. Adjoining refrigerating plant assures placing temperature of 55 deg.



TRANSFER CAR charges Gar-Bro 8-yd bucket by chuting concrete from hopper.



BUCKET dumps inside cantilever forms. Two 25-ton cableways handle most placing.

Gets More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back *at ground level* gets BIGGER LOADS with less spillage.

Keeps More

Heaped loads are cradled closer to the machine for greater stability and can be carried at lower level. Exclusive load shock-absorber cushions the load during travel, smooths out the ride, and permits faster movement with less spillage.

Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result—you *deliver* MORE. This new PAYLOADER is a more PRODUCTIVE machine which will handle more yardage at lower cost.

more yardage at lower cost...
New 2¼ yard PAYLOADER®

The new model HO is the finest four-wheel-drive tractor-shovel ever offered. All the *exclusive* features that increase yardage output enable it to handle many kinds of jobs never before practical with wheeled tractor-shovels.

It operates easier and faster, rides smoother, with or without a load, than anything near its size. It has *balanced* design and durability throughout to turn out big production day after day. If you want *proof* of its *productive capacity* and superior *performance*, ask your "PAYLOADER" Distributor for a demonstration.

Safety and Stability

The safest and most stable wheeled tractor-shovel ever built. Moving members cannot injure operator because of underslung boom arm design and positioning. With loads carried lower and closer to the machine, cushioned during travel, and with longer wheel-base, the utmost in stability is achieved.

More Production, Less Effort

Power-steering, power-brakes on all four wheels, power-shift with no clutching or stopping for range changes and good balance and riding qualities reduce operational fatigue — promote full production all day.

Digging Power

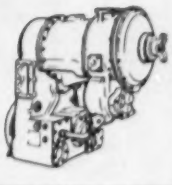
Pound for pound, the new model HO has more traction and digging power — for a wider range of ground conditions — than any wheeled tractor-shovel ever built.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY - INTERNATIONAL HARVESTER COMPANY

Torque-Proportioning Differentials *Reduce Wheel Slipping*

Another exclusive "PAYLOADER" feature which assures better traction under adverse conditions. If one wheel starts to spin, more power is delivered automatically to the other wheel.

Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing keep torque low in axles, prolong life of drive-train parts as well as axles.



Complete Power-Shift Transmissions

"Complete" since ALL shifts can be made instantly and on-the-go, under full engine speed. There's NO STOPPING for a range-shift, there's no foot clutch pedal. With the forward-reverse control, the operator can "inch" the machine while maintaining full engine speed to provide maximum bucket lifting and dumping power. Torque converter drive cushions power-train shocks.

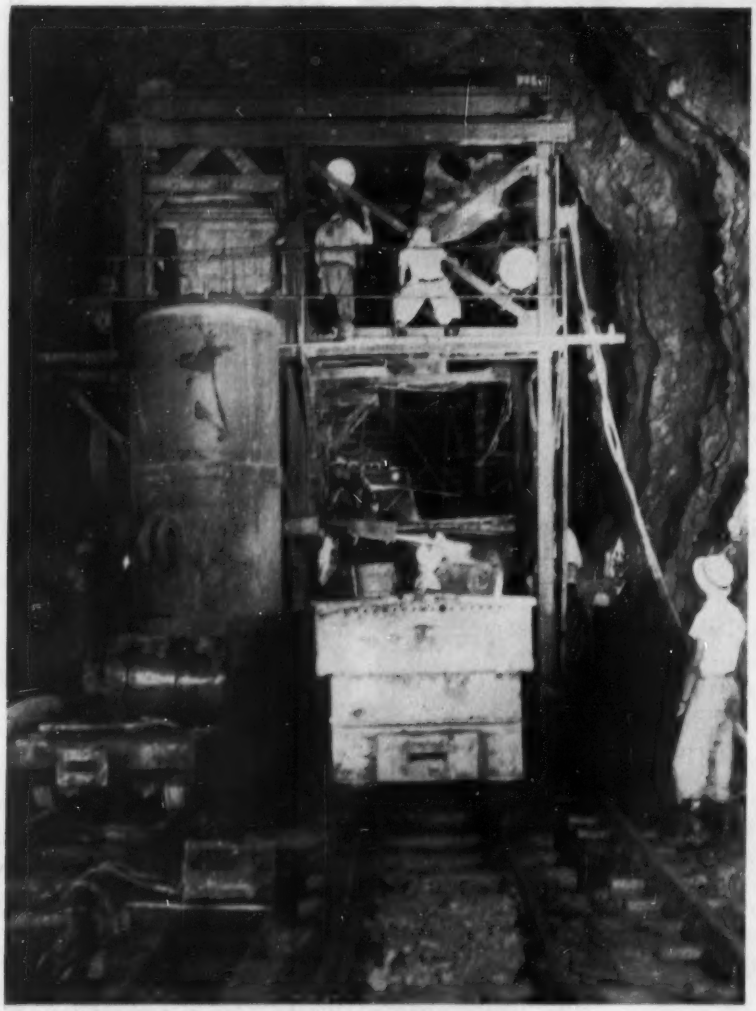
THE FRANK G. HOUGH CO.
706 Sunnyside Ave., Libertyville, Ill.

Send information on "PAYLOADER" tractor-shovels:

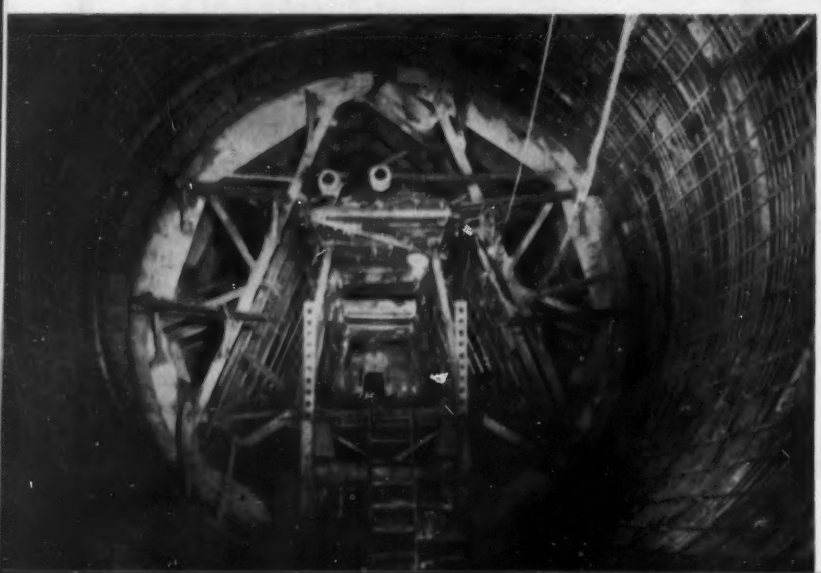
☐ model HO — 2¼ cu. yd. heaped, 1¾ cu. yd. struck
☐ model HH — 1¾ cu. yd. heaped, 1½ cu. yd. struck
☐ model HU — 1 cu. yd. heaped, ¾ cu. yd. struck

Name_____
Title_____
Company_____
Street_____
City_____ State_____

Lining Pressure Tunnels Is Fast Job



OVERHEAD TRAVELING CRANE mounted on jumbo dumps 2-yd bucket of concrete into pugmill hopper (above) during lining of 3,800-ft tunnels. Full circle forms supported on needle beam (below) are 40 ft long. Best monthly production was 680 ft.



SAKUMA DAM . . .
Continued from page 131

grizzly went over a second 8-in. grizzly, and the rejects were fed into two primary 32-in. jaw crushers.

The product from the crushers and the 8-in. grizzly was moved 1,035 ft on a 36-in. belt conveyor to a raw storage pile adjacent to the main screening plant. Material was withdrawn from raw storage on a 36-in. belt and discharged on a 5x12-ft Tyler vibrating screen. Oversize dropped into a 25x36-in. secondary jaw crusher to be broken down to 6-in. maximum size before continuing to the main screening plant.

With a capacity of 700 tph, the plant washed and separated material into four sizes of coarse aggregates and sand. The gravel was sized on vibrating screens and stored over an 8-ft reclaiming tunnel. A Japanese-made A-C Hydro-Cone crusher balanced pit run material to meet demand of the plant.

Sand processing began at the main screening plant, but was finished and graded with Dorr sizers and classifiers in a separate plant with a capacity of 200 tph. Sand drained in large storage piles placed over an 8-ft reclaiming tunnel before being conveyed to the mixing plant.

Four sizes of gravel were stored in adjacent piles so that a single reclaim conveyor could tap the center of the piles below each respective rock ladder. Two 30-in. reclaiming conveyors in series discharged sand upon the end of the 36-in. gravel reclaiming belt, allowing either sand or gravel to be transported to the main batching and mixing plant by a single main conveyor.

Construction of the main belt conveyor system between the aggregate plant and batch plant presented many problems because of the rugged topography. Its total length was 6,400 ft, made up of 12 separate belts. About 60% of the length is in traffic or special tunnels. The separate belts are electrically driven by motors interlocked in their controls to allow the belts to start consecutively, beginning at the intermediate rescreen and storage plant.

To assure proper gradation, a rescreening plant was located along the main conveyor, 1,500 ft from

FIELD-TESTED DESIGN of new G-E 200-amp welder solves old and costly load drop-off problem in construction welding.

For hour after hour of sustained welding . . .

New G-E 200-amp Welder Delivers Steady Output Even at Full Load

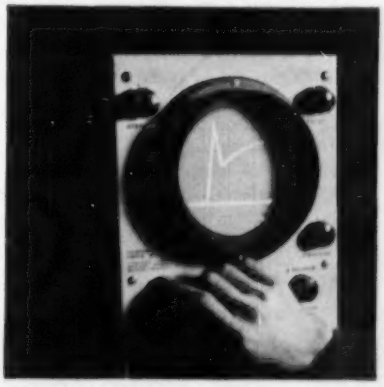
Now, with the new G-E 200-amp engine-drive welder you can be sure of reliable construction welding—even for sustained operation. This powerful new welder makes it unnecessary to buy more expensive, higher rated machines just to make sure you get full 200-amp output when you need it.

This field-tested welder gives you steady output and 100% arc stability—hour after hour—even when operating at full load. This is made possible by combining a generator specially designed for field use with a direct-connected Hercules engine.

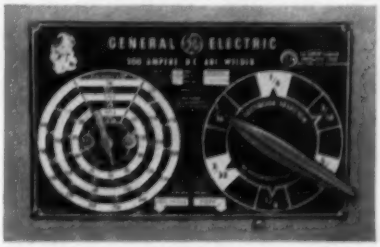
In addition, the high recovery voltage of the welder gives you complete freedom from "popouts," no matter what type or size electrode you use or where you set the controls.

This rugged new G-E welder has already received the enthusiastic approval of pipeline and construction weldors, foremen, and superintendents. Test it yourself and take advantage of its many advanced design features . . . new engine slow-down control to save fuel and oil while not welding; heavy gauge metal construction (16-gauge canopy, ¼-inch crossbars) to withstand rough field conditions; non-projecting generator protected by full length canopy; and many others.

Contact your nearby G-E Welding Distributor (he's listed in the yellow pages of your phone book) or write for bulletin GEC-1333, Section 714-4, General Electric Co., Schenectady 5, New York.



OSCILLOSCOPE shows 200-amp welder delivers steady output, full heat at full load.



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Progress Is Our Most Important Product

GENERAL ELECTRIC

Glory Hole Traps Surge Tank Muck

the mixing plant. Forming the base and foundation for the rescreen towers are concrete storage bins capable of holding a total of 1,200 yd of gravel and 400 yd of sand to provide emergency storage. From this intermediate storage plant, aggregates move over a 36-in. conveyor which discharges into a swivel chute atop the batching plant.

Pressure Tunnels

Water from the future reservoir of the dam will be delivered to the powerhouse through two reinforced-concrete-lined tunnels with an excavated dia of 27 ft and a finished dia of 23 ft. These tunnels have a twin tower intake structure located on the left abutment several hundred feet from the upstream face of the dam.

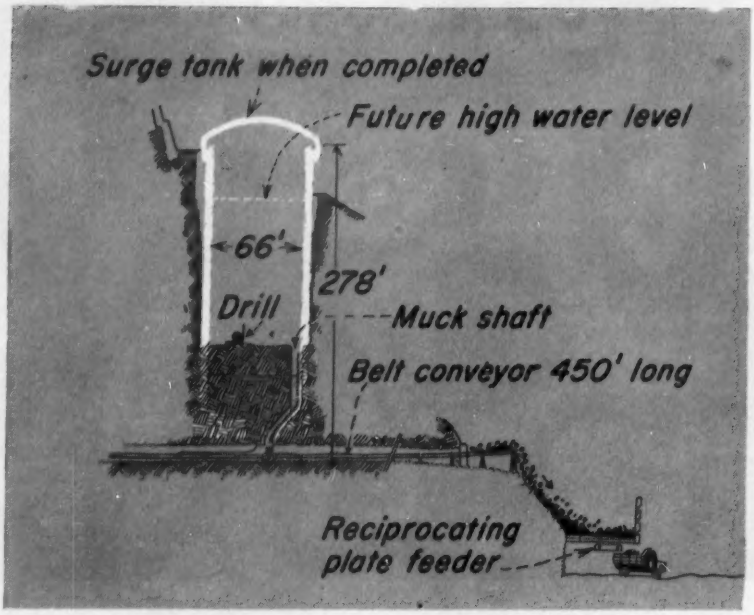
Each tunnel was driven from a single full-face heading through good granite rock. Two drill jumbos were built to permit the passage of hauling equipment. Each jumbo had 13 hydraulically controlled booms mounting Japanese drifters.

A typical round contained 95 to 110 holes 13 ft deep, producing a factor of 2.5 lb of ammonia blasting gelatin per yd of rock. After blasting, muck was loaded into 6-yd cars by Eimco loaders. Because of the wide heading, two loaders operated in a parallel pattern.

Excavation progress in the tunnels recorded maximum advances of 27 ft per day in tunnel No. 1 and 25 ft in tunnel No. 2. An average advance of 16 ft per day was made for five months in tunnel No. 1.

Full circle steel forms supported on a needle beam handled concrete lining in 40-ft lengths. Concrete was delivered to the forms by means of two 1⅛-yd concrete placers which were mounted on a jumbo that picked concrete buckets from a train of flat cars and dumped the concrete into a pugmill before the concrete placers were charged. The 40-ft section of lining required approximately 300 yd of concrete.

A cycle of 48 hr to place concrete, strip, and reset the forms was scheduled. Maximum tunnel lining placed in No. 1 and No. 2 pressure tunnels during a 31-day period was 560 and 680 ft respectively.



WAGON DRILLS put down blast holes for underground surge tanks. Only half of area is blasted at a time to permit Cat D8 dozer to remain in hole. After shot, muck is pushed into glory hole and conveyed to truck. Walls are lined by jumbo hung from overhead gantry.

Surge Tanks

Connected to each pressure tunnel and adjacent were individual surge tanks built almost entirely underground. The excavated diameter of the surge tanks was 79 ft. No. 1 had an excavated depth of 320 ft and No. 2, 230 ft, making the volume of excavation to be handled 55,000 and 40,000 yd respectively.

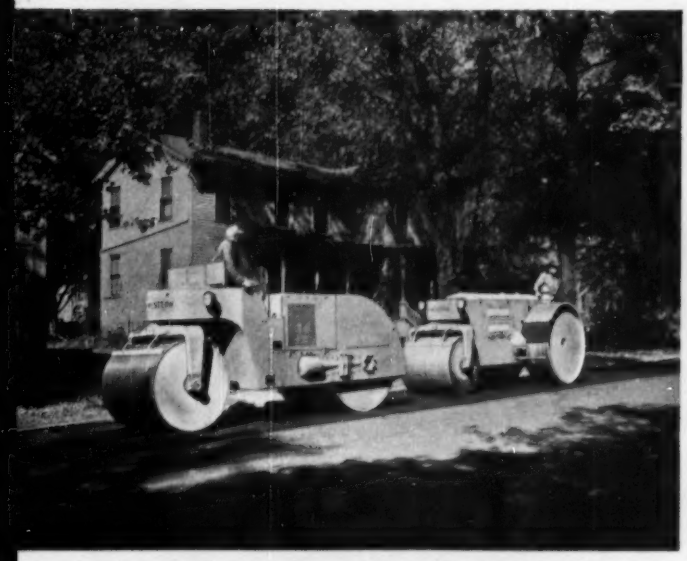
Construction of a road to the top of the surge tanks would have been too expensive. As an alternate, a 10-ton capacity cableway was erected to transport the necessary materials and equipment to the top of a steep rock ridge above.

The schedule required that excavation in the surge tanks be carried on simultaneously with excavation for the pressure tunnels, penstocks, and powerhouse immediately below. While a bench was being excavated at the collar of each surge tank, two vertical shafts were bored from an access adit below at the pressure tunnel

(Continued on page 140)

AUSTIN-WESTERN ROAD ROLLERS

Engineered for Precision Operation and Trouble-free Performance



In this new series of Rollers . . . by America's first builder of motor rollers . . . all that is latest and best in engineering techniques and skills is combined with highest standards of construction to produce a truly fine product. With gasoline or diesel engines . . . dry clutch or torque converter drives . . . two-speed or four-speed transmissions, and drum-type front and rear rolls for water or sand ballast, these Rollers perform in a manner that will satisfy the most critical owner or operator . . . engineer or inspector. Your nearby A-W distributor will be glad to tell you the whole story. Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Aurora, Illinois.

Engines, clutches, torque converters, brakes, hydraulic system units, bearings, seals and more than 75% of all other parts are interchangeable on Tandem and 3-Wheeled Rollers . . . an important service and repair advantage for the man who owns both types.

Tandem Rollers range in weight from 5 to 14 tons. Each is available with gasoline or diesel engine, and optional torque converter drive.

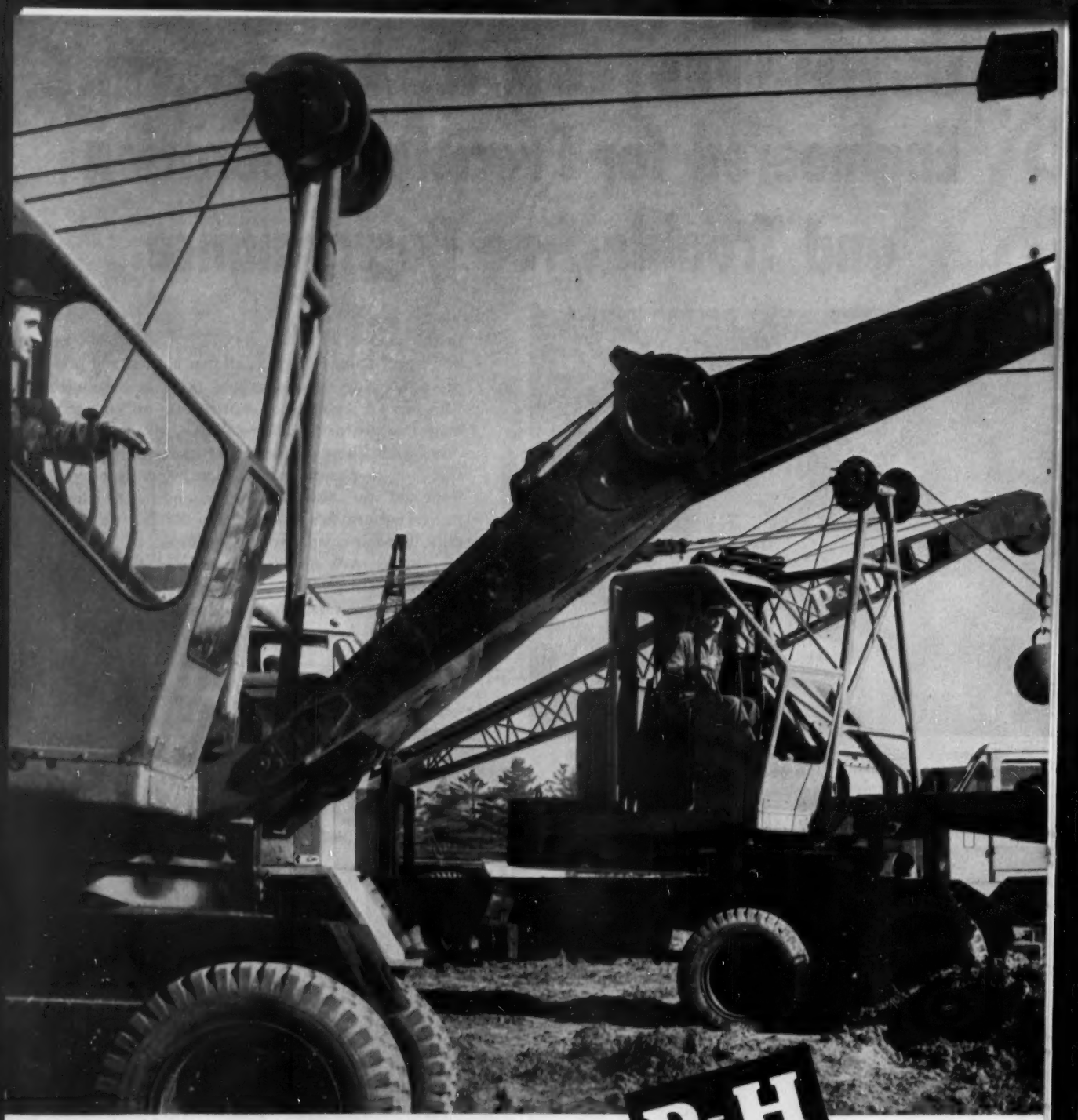
COMPLETELY NEW

3-Wheeled Rollers range in weight from 7 to 14 tons. Each may be had with gasoline or diesel engine, and optional torque converter drive.

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON

AUSTIN-WESTERN WORKS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division
OTHER DIVISIONS: Eddystone • Lima • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Standard Steel Works • Madsen • Pelton



Proving that P&H has

Today P&H is recognized as the leader in the excavator industry.

Why?

Because P&H, and P&H alone, has taken excavators out of the steam shovel era and applied automotive-type construction, automotive-type power trains and automotive-type controls to power cranes and shovels.

The result?

Power crane and shovel performance that delivers the highest net operating profit.

No matter what your shovel or crane needs are, be sure to get the full, profitable benefits of P&H unit rolled construction, *fabricated by arc welding.* This feature *alone* eliminates troublesome assembly by multiple mechanical joints, bolts, rivets and tie rods!

Get the full P&H story—proof that P&H has the "guts" to do any job; proof that is borne out every day on the Harnischfeger Proving Grounds where every shovel and crane is thoroughly tested. Harnischfeger Corporation, Milwaukee 46, Wisconsin.

the P&H *Line*

TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PREFABRICATED HOMES · HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

the GUTS to do the job!

The unretouched photograph above shows P&H equipment being tested at the Escanaba, Michigan, Harnischfeger Proving Grounds

For Modern Engineering, Look to

HARNISCHFEGER

Power Crane & Shovel Division

COMMENT
from the
BUTLER ENGINEER

Of Ready Mix, Roadbuilders, Blocks and Awards

Very interesting, very gratifying, very sound is the sharp trend toward automation in the concrete products industry . . . When Butler Bin piloted the first completely automatic, one-man operated Roadbuilders Plant we expected the rush that followed. And Butler automatic, electronic batching, led to quick conversions in the Ready Mixed field.

And now we find that the concrete block field has been equally alert to see the tremendous advantages of automation in product control and in production economy.

•

Incidentally, Butler entered the automation field in the right position: first—and we still are.

•

And speaking of Roadbuilders set-ups, one of the fine national magazines, CONSTRUCTION EQUIPMENT, cited the Butler Automatic One-Man Roadbuilders as Product of the Month. This is an award made only after careful analysis and screening by a completely impartial board of judges. We're very proud — but we're *not* in the nose-in-the-air department. Head in the clouds maybe but feet very much on the ground — and determined to win the Award again. A sweeping bow to CONSTRUCTION EQUIPMENT. A martini will be hoisted in thanks by the Butler Engineer at 5:00 P.M. today. Maybe every day.

•

Went to the movies t'other night. Kim Novak in "Picnic". Those who can take their eyes off the delectable Miss Novac, will see a Butler Ready Mix Plant in the background in one scene. You missed the background? I don't wonder.

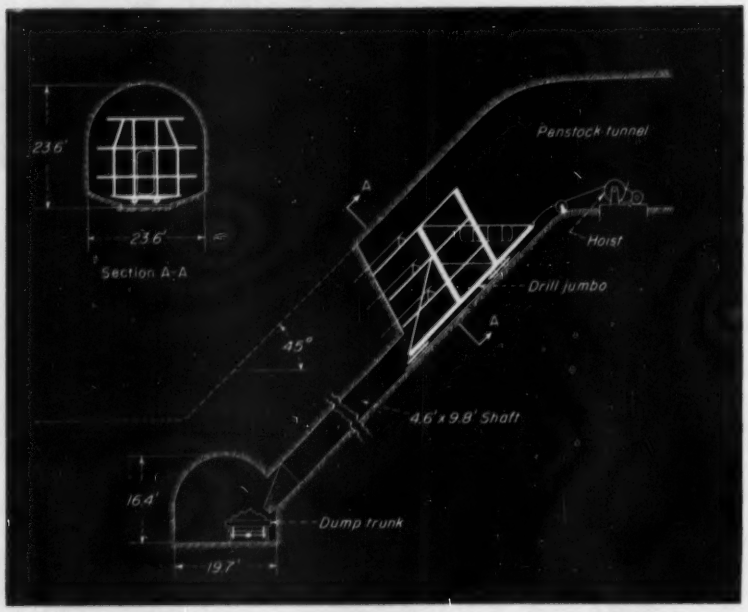
I'm Kim-minded,

The Butler Engineer

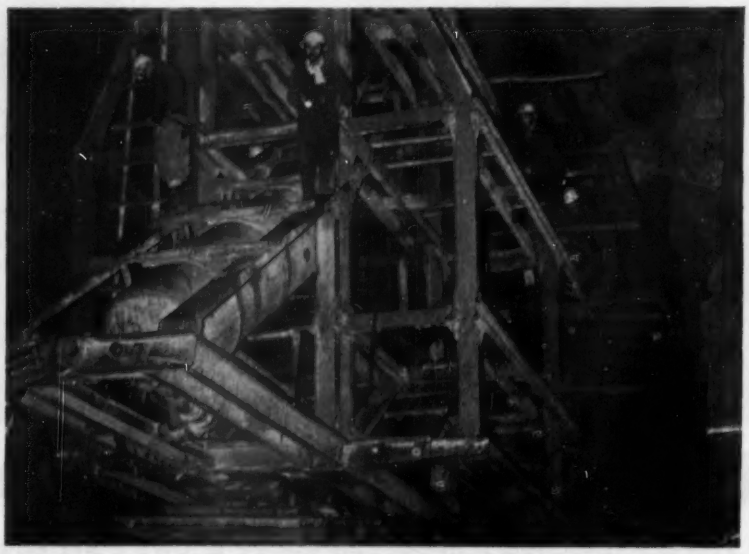
BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

SAKUMA DAM . . . Continued from page 136

Hanging Jumbo Drills Inclined Penstock Tunnels



PILOT SHAFT at base of 23-ft dia penstock tunnel carries muck to dump trucks which haul to side-hill disposal area. Blast holes are drilled into main face from special rail-mounted jumbo that is pulled back and forth by winch set up at top of 45-deg tunnel.



level. Completion of these shafts, which were located between the vertical center and wall line of the surge tanks, provided a convenient means for trapping the muck from the full scale excavation operations.

Only a half section of the area was drilled and blasted at a time, permitting a D-8 and other equipment to remain in the hole.

After each shot, the blasted muck was dozed into the 7 x 8-ft vertical shaft. A pan-type feeder at the bottom of each shaft loaded the muck on a single 48-in. belt conveyor serving both surge tank excavations. This conveyor, about

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gets the work done *FASTER* at *LOWEST* cost!

ONLY GENERAL GIVES YOU STRONGER-THAN-STEEL NYGEN® CORD FOR EXTRA PROFIT ON THE JOB!

Every hour of every day, in quarries and strip mines, on logging and construction jobs the nation over, The General Tire proves its reputation for toughness, strength and dependability.

Delivering deep-down driving traction and high flotation *plus* Nygen Cord protection against job hazards, The General Tire continues to get the work done faster at lowest cost wherever it operates!

THE GENERAL TRUCK TIRE

Specify GENERALS *on your new equipment*

THE GENERAL TIRE & RUBBER COMPANY · Akron, Ohio

R/M *Poly-V® Drive*
Delivers More Power in Less Space!

No other belt drive can deliver as much power in the same space. It's R/M's patented Poly-V* Drive developed by R/M engineers after years of research. This totally new concept in power transmission delivers up to 50% more power than a conventional V-belt drive of equal width.

Unique design accounts for the unusual power capacity of R/M Poly-V Drive. A *single, endless* belt with parallel V-ribs runs on sheaves specially designed to mate precisely with the belt ribs. The uniform pull of this single unit belt distributes drive load evenly over the full width of the sheave . . . gives higher horsepower capacity per inch of drive width than ever before possible.

There are many advantages in this space saving drive . . . Poly-V has eliminated the matching problems of multiple V-belt drives, greatly increased the life expectancy of belts and sheaves and maintains more constant speed ratios under all loads. Just *two* cross sections of Poly-V meet every heavy duty power requirement . . . costly belt and sheave inventories are kept to a new low! R/M Poly-V Belts have strength members of superior synthetic cords, are oil-proof, non-spark and heat resistant.

Let an R/M representative demonstrate how you can improve your power transmission applications . . . get "More Use per Dollar" . . . with R/M Poly-V Drive. Contact R/M . . . or write for Poly-V* Drive Bulletin #6638.

CONDOR V-BELTS • R/M SUPER-POWER V-BELTS

Write for Bulletin #6868 on the complete line of Condor V-Belts for regular service on conventional V-belt drives. Also write for Bulletin #6628 on R/M Super-Power V-Belts with 40% more Horsepower capacity where needed.

*Poly-V is a registered Raybestos-Manhattan Trademark RM 609

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls

SAKUMA DAM...

Continued from page 140

450 ft in length, discharged the muck on a side hill dump which also was used for the pressure tunnel excavation. In a loading station below the dump, reciprocating plate feeders loaded 12-yd dump trucks, which hauled and placed the muck on a fill for a relocated railroad.

A considerable portion of the surge tank excavation was done in a highly fractured rock formation. To give protection to the workers and prevent serious cave-ins, a concrete lining was placed as the excavation deepened.

Specifications required that each surge tank be constructed with a wall of reinforced concrete 6½ ft thick at the bottom and lined with steel for a distance of 180 ft above the tank floor. A large annular-type form jumbo acted as a template for the portion of the tank to be steel-lined, and also served as a concrete form above the steel-lined portion. It suspended by cables from a structural steel gantry erected over the collar of the surge tank so it could be lifted.

Penstock

Penstock tunneling was tricky. An inclined shaft 8x10 ft was driven upward at an angle of 45 deg along the invert grade of each of the four penstock tunnels. When the shafts were completed, penstocks were excavated from the top down to the powerhouse. As the rock was blasted, the muck dropped into the inclined shaft and was drawn off at the lower end into dump trucks that hauled out through a temporary access tunnel. Before blasting, the drill jumbo, mounted on rails, was pulled up a safe distance from the face

To place the concrete lining, a set of steel forms operating on a needle beam started at the lower end of the penstock tunnels as concrete was delivered with a Pumpcrete machine. The winch anchored at the top of the tunnel moved the forms and needle beam as required. After the lining was completed, the steel penstock sections were lowered in the tunnels on a special car and welded.

As soon as the first water is channelled through the powerhouse, excavation will begin on a stilling dam, which will be one-twelfth the size of the main dam.

Representatives of Guy F. Atkinson Co. are Hugh Parker, Jack Broton, and Richard Rofelty.

WRIST-LIKE ACTION...

Produces Beautiful Floor Finishes

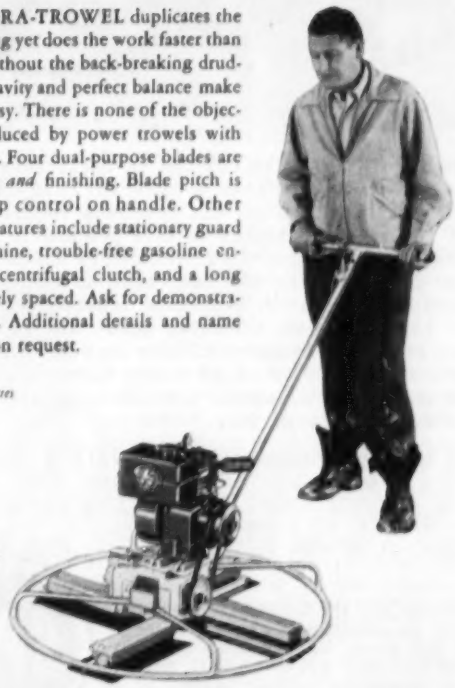
The NEW Kelley

HYDRA-TROWEL

(PATENTS PENDING)

The new Kelley HYDRA-TROWEL duplicates the quality of hand-finishing yet does the work faster than hand-troweling and without the back-breaking drudgery. Low center of gravity and perfect balance make operation amazingly easy. There is none of the objectionable gyrating produced by power trowels with high centers of gravity. Four dual-purpose blades are used for both floating *and* finishing. Blade pitch is adjusted by finger-tip control on handle. Other HYDRA-TROWEL features include stationary guard ring for carrying machine, trouble-free gasoline engine with heavy-duty centrifugal clutch, and a long handle with grips widely spaced. Ask for demonstration and be convinced. Additional details and name of nearest distributor on request.

A few good distributor territories still available.



Kelley also makes the Kelley Compactor for:
- Floating dry-mix topping
- Driving in surface hardeners
- Grinding out surface imperfections.

Kelley MACHINE DIVISION

WIESNER-RAPP CO., INC.

285 HINMAN AVE., BUFFALO 23, N. Y.

The Engineer's Field Report

CASE HISTORY
LUBRICANT RPM Multi-Service Gear Lub.
FIRM Rothschild, Raffin + Weinick San Francisco, Calif.

"No trace of wear" in gear boxes or rear ends after 4½ years of heavy construction work!

WORKING AT CHERRY VALLEY DAM in California's High Sierra, RR&W operates a wide variety of heavy equipment in handling all concrete requirements. For complete protection on this job and to prevent costly maintenance, the firm uses RPM Multi-Service Gear Lubricant in all rear ends and gear boxes. Heard Bonner, Master Mechanic, reports "my Chevrolet pickup has 96,000 miles on it and it's never been worked on. We haven't lost a rear end or a gear in in almost five years of tough work. Every rear end we've ever inspected has been completely clean without a trace of wear."

The 163 h.p. Scoopmobile (above left) loads aggregates at batch plant. The Northwest crane (right) with a Murphy diesel engine, lifts and positions 8-ton, 15'4" OD tunnel liner sections. Other RR&W equipment using RPM Multi-Service Gear Lubricant includes four ready-mix trucks, three dump trucks, a 3/4-yard Unit crane, and three bulldozers.

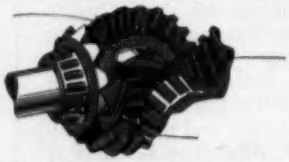
FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your distributor, write or call any of the companies listed below.

RPM

TRADEMARK "RPM" REG. U. S. PAT. OFF.

Why RPM Multi-Service Gear Lubricant prevents wear in severe conditions

Contains a special compound that reacts chemically with metal to form a protective lubricating coating...resists rubbing action of hypoid gear teeth.



Withstands extreme temperatures and pressures...highly oxidation resistant. Keeps gears and bearings cool.

Inhibitors resist rusting, stop foaming in cases. Lubricates integral bearings and other parts. Will not separate.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

Cranes Replace Travelers On Bridge Erection

A PAIR of long-boom cranes did a fast job of erecting assembled bridge trusses near Buford Dam, Ga. They also made possible big money savings over conventional methods of cantilever erection with traveling derricks. The cranes permitted fast assembling, eliminated falsework, and cut out all jacking.

The efficient erection method was devised by Bristol Steel and Iron Works, Inc., Bristol, Va., for the Lanier Bridge over the Chattahoochee River. This section of the river now is backing up behind recently-completed Buford Dam, and eventually will form a huge lake.

The bridge consists primarily of a four-span continuous deck truss. Its two center spans are 260 ft long, and the end spans are 200 ft long. On one end of the continuous truss is a simple deck truss 137 ft long, and on the other end are three beam spans. The top chord of the trusses at the center of the bridge is 130 ft above ground.

Bristol moved in swiftly before the river began to flood and did a fast job of erection. The contractor assembled all trusses on the ground directly below their points of placement. This permitted a small truck crane to assemble the huge truss sections on temporary blocking on the ground. It also made possible the driving of at least one-third of the field rivets before hoisting.

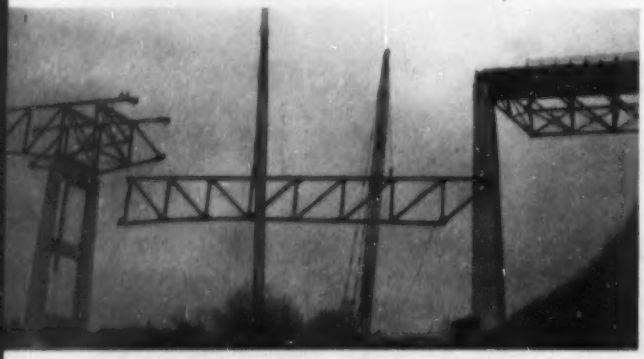
The erection procedure was as follows. Four-panel truss sections 84 ft long and 27 ft deep were hoisted and centered at the tops of intermediate piers. They were prevented from overturning in a longitudinal direction by guys anchored to pier struts. These guys

(Continued on next page)

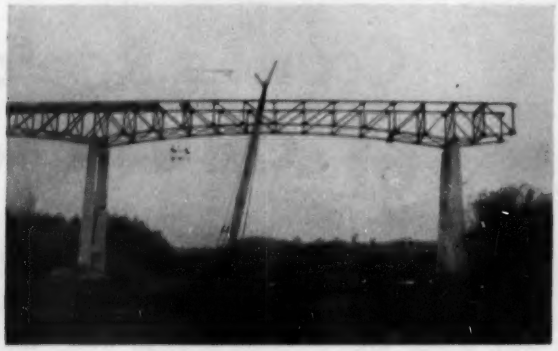
ASSEMBLING big trusses on ground and hoisting in place is fast and economical.

SECTIONS above piers are the first to go up. They are guyed to prevent overturning.

FILL-IN TRUSS is hoisted by long-boomed Manitowoc and P&H cranes. It is 160 ft long and weighs about 29 tons. Top of truss is 130 ft above ground. Next year, area will be covered by 46,000-acre lake formed by recently completed Buford Dam.



CRANES easily lift assembled section. Method showed a big saving over cantilever erection with travelers and falsework.



FULL-SPAN TRUSSES are connected with cross bracing. Erection requires no jacking. One-third of rivets are driven on ground.

LANIER BRIDGE...
Continued

were adjustable so that truss sections could be rotated slightly when adjoining trusses were erected. Other guys were anchored to dead men to prevent transverse overturning.

Once these pier sections were in place, a Manitowoc crawler crane and a P&H truck crane quickly hoisted anchor-arm and fill-in sections. No jacking was required. Assembled units ranged in length from 80 to 160 ft and weighed up to 29 tons. When truss erection was completed, the bridge was decked with steel grating.

Cuyler S. Poor is manager of erection for Bristol Steel and Iron Works, Inc., and Charles Jackson is resident engineer for the Corps of Engineers, U. S. Army.

COMPLETED BRIDGE across Chattahoochee River consists mostly of 4-span continuous trusses. Two inside spans are 260 ft long, and two outside spans are 200 ft long.

NEW International® Payhaulers

for years a leader in the manufacture of heavy-duty construction equipment, International now offers you the same fine engineering and rugged dependability in

OFF-HIGHWAY HAULERS

MODEL **95** 24 TONS

TWO **ALL NEW** MODELS

MODEL **65** 18 TONS

NEW RUGGEDNESS - POWER - COMFORT - ECONOMY

Announcing the NEW

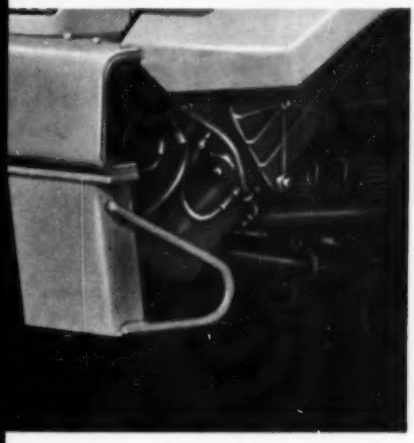
Designed with features you asked for

250-335 HP Turbo-Charged Diesel Engines
Rugged, Welded, All-Steel Frame
Full-Floating Axles Planetary Drive
Speeds to 38 MPH
Power Shift Transmission

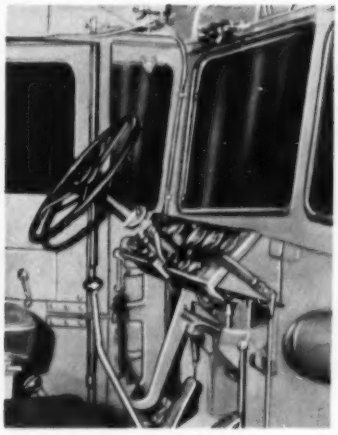
Hundreds of contractors, mine owners, quarry operators, and other equipment users told our engineers what they needed in an off-highway hauler. Their suggested design features have been carefully built into the new International Payhaulers. In these rugged, all-new, rear-dump haulers, you have greater horsepower-to-payload weight ratios than are available in most other off-highway trucks. You have stronger main frames to carry bigger payloads with rugged dependability. You have higher hauling speeds . . . full-power hoists for faster dumping . . . better visibility. These features are the result of rigorous, thorough, field testing. Payhaulers have worked on many different contracting, mine, quarry, and similar jobs. Others have run "round-the-clock" at our proving grounds. Others have undergone painstaking laboratory research. Now all this testing is completed and the Payhaulers are ready to roll. You owe it to yourself to check their features. Our test users did—and, as proof of outstanding Payhauler performance, a great many have placed their orders. The following pages detail the output-increasing, cost-cutting features they're getting. You should compare Payhaulers with your present hauling units to see what profit-making features you will get.

Designed for operator comfort easier operation

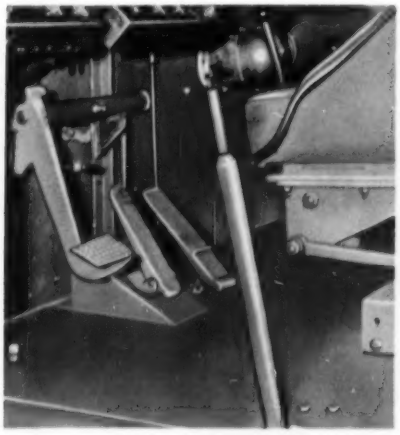
Driver looks through giant windshield, has picture window vision ahead and to both sides. When backing into close quarters, he need only open door and look around; offset cab gives unobstructed view to rear. Vents at top, bottom, and rear of cab provide a cool "office" for the operator.



Power Steering. No broken thumbs in the new International Payhaulers! Hydraulic boost gives operator power-steering control on haul roads—effortless steering when spotting under shovels.



The Driver "Takes It Easy" in the comfort-designed Payhaulers. He sits in a leather-covered, bucket-type, fully-adjustable seat. Jars and jolts are cushioned through compression spring, hydraulic shock absorber. He handles center-grouped, easy-to-reach controls. Clean floor with suspended brake pedal, handy hoist lever location make the operator's job even easier.



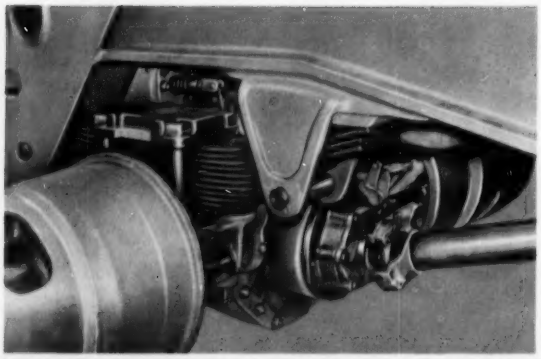
Accessible Service Checks. Outside mounting speeds air cleaner servicing. Inspection port in hood permits ready access to oil dip stick and filler pipe. Lightweight aluminum side sheets are easily removed for engine inspection.

Full Day's Fuel Supply. There's no need to slow down a Payhauler job for refueling. These big haulers pack 125 gallons, enough fuel for a full day's operation on most jobs. Filter-type breather caps and built-in strainers help keep fuel clean and grit-free.

International® Pay

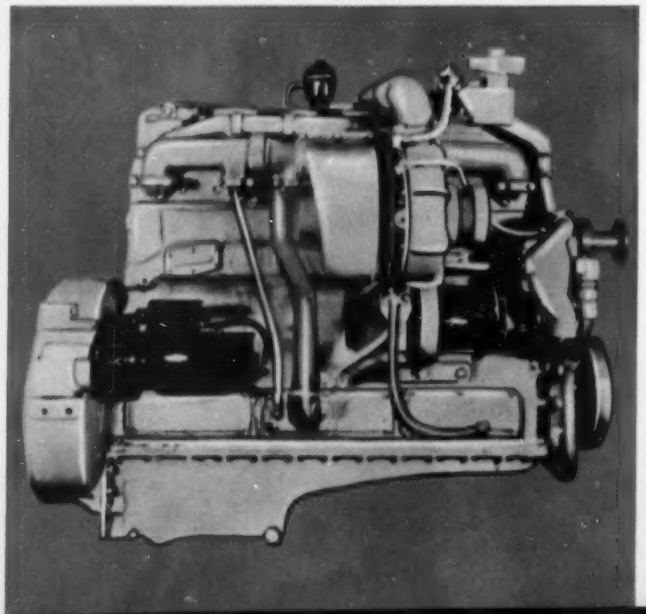
Rock-rugged

Rugged Frame. Built of heavy-duty welded and conventional "I" beams with web thicknesses of ½ and ¾ inches, Payhauler main frames have the strongest section modulus known of any off-highway truck. Rear-frame section of rolled "I" beams is held rigid by tubular torque and hoist mounting members. Front frame sections flex with shock loads through channel bumper torque member.



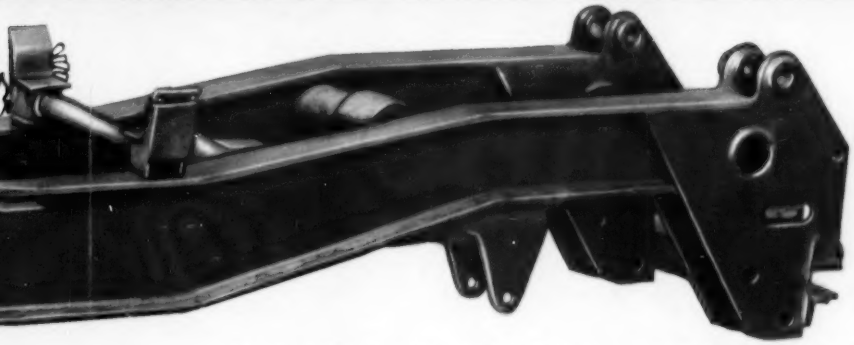
Free-Floating Springs. *From the ground up, Payhaulers pack extra strength for outstanding performance on rugged jobs.* Semi-elliptic, multiple leaf, free-floating springs effectively "swallow" the shocks of loading from big shovels and of high-speed hauling over rough ground. Heavy-duty, radius rods keep springs and axles in position.

Pay-off powered

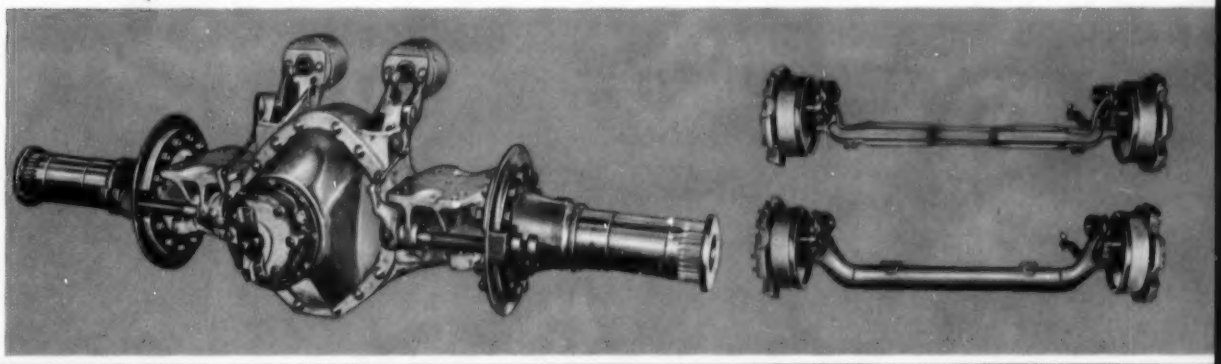


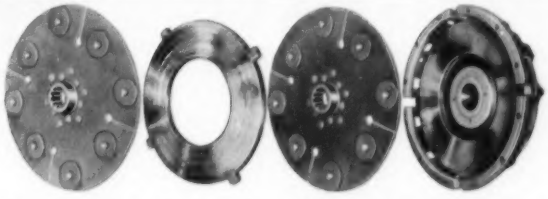
Both the "65" and "95" Payhaulers have more horsepower per struck yard than any other truck in their size class. The 24-ton, 16-yard "95" is powered by a 335 hp diesel . . . the 18-ton, 12-yard "65" is powered by 250 hp engine. Turbo-charging keeps power high, weight low, reduces fuel consumption 10% or more. Large radiator (below) with 1425 sq. in. of area plus powerful 32-inch fan insure proper engine cooling under all job conditions. Suspended on four large rubber mounting pads, the Payhauler radiator is protected against shock.

yhaulers



Sturdy Axles. Durable axles help Payhaulers carry 36,000 to 48,000 lbs. smoothly, comfortably at speeds up to 38 mph. Note the massive differential housing with in-built spring mounting pads. Heavy-duty, rear axle housings bolt to the differential to provide top load carrying capacity. Front axles are equally sturdy—of forged or tubular design.



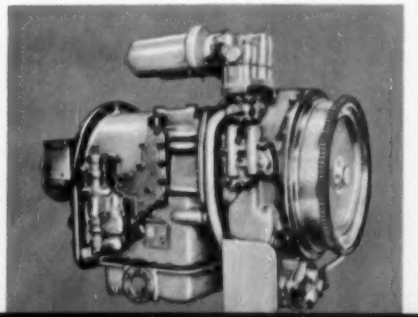


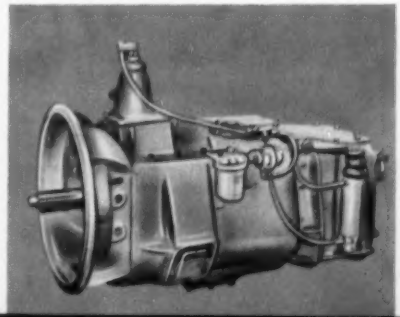
Cerametallic Clutch. In gear-drive models, cerametallic clutch facings virtually eliminate over-heating. This clutch, made of heat-defying material, needs fewer adjustments, gives longer life, smoother action than any other clutch in the off-highway truck field.

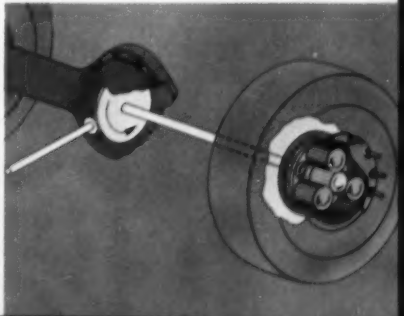
Torque Converter. The 24-ton Model 95 Payhauler is available with a 4-speed Torque Converter transmission for smooth speed changes from 4.8 to 38 mph. A lock-up clutch for direct drive performance and a Torqmatic brake system are standard with the versatile Torqmatic transmission. No other truck provides these features as standard equipment.

Conventional Transmission. You have a choice in the "65" Payhauler of a 5 or 10-speed geared transmission to fit job conditions—speed ranges are from 3.5 mph to 36.5 mph for either. In the "95" Payhauler, a 9-speed transmission provides an excellent range of speeds from 2.6 to 37.2 mph. Operators especially like the single lever air-assisted shift control.

Planetary Final Drive. Both Payhaulers translate engine power into big load handling capacity through a rugged differential to planetary drive wheels. Sun gear is integral with full-floating axles for greater strength and simplified maintenance.







4 RUGGED BODIES meet all hauling needs

Payhauler bodies are all welded, reinforced steel designed with oak fill to cushion shock loads. Inside floor and side sheets are durable Manten steel. For the Models "65" and "95", you can get a rugged quarry body—for the Model 95, two standard bodies (heated or unheated) are available to fit any job condition or material.

BRIEF SPECIFICATIONS	Model 65	Model 95
Capacity	18 tons	24 tons
Engine hp	250	335
Transmission	10-speed gear 5-speed gear	9-speed gear Torque Converter
Steering	Hydraulic	Hydraulic
Weight—Gross with Payload	76,160 lbs.	96,220 T.C.

Specifications Subject to Change Without Notice

INTERNATIONAL HARVESTER

INTERNATIONAL®
Construction Equipment

INTERNATIONAL HARVESTER COMPANY, 180 N. Michigan Avenue, Chicago 1, Illinois

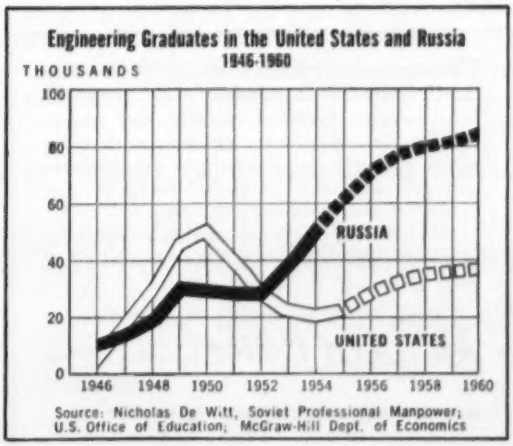
A COMPLETE POWER PACKAGE: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines.

THE SHORTAGE OF SCIENTISTS AND ENGINEERS:

Are We Losing the Race with Russia?

THERE is new confidence in the Kremlin. One key reason is expressed in a recent boast of Communist Party Secretary Khrushchev: **"The capitalists always regard our people as being backward, but today we have more engineers and more supporting engineering technical personnel than any capitalist country."** He promised that this lead would be widened and that communism would be victorious without war.

This boast cannot be dismissed as communist propaganda. Admiral Lewis L. Strauss, chairman of the U. S. Atomic Energy Commission, has warned: **"In five years our lead in the training of scientists and engineers may be wiped out, and in ten years we could be hopelessly outstripped. Unless immediate steps are taken to correct it, a situation, already dangerous, within less than a decade could become disastrous."**



This second editorial in a series on the shortage of scientists and engineers is designed to explore as carefully as possible the facts and the implications of the new emphasis on technical training in the Soviet Union. It draws heavily from the authoritative book *Soviet Professional Manpower*, prepared for the National Academy of Sciences and the National Research Council by Nicholas DeWitt of the Russian Research Center of Harvard and released recently by the National Science Foundation.

Trend Is Against Us

If the Soviet Union already has a lead in technical manpower, it is not very great. Both the United States and Russia now have around a million scientists and engineers. About a third of the Russian engineers were trained on inferior pre-1935 standards. **It's the trend — shown in the chart — that is alarming.**

Over the last five years we have turned out only 142,000 engineers, compared to an estimated 216,000 in Russia. In 1955 our output was around 23,000 compared to their 63,000. Over the next five years our projected output is 153,000, against at least 400,000 in Russia. There will be an additional 150,000 or more in the satellites and Red China.

In Russia, 30% of the college students are in engineering, compared to 8% here. Another 30% or more take degrees in natural sciences. Moreover, unlike ourselves, the Russians are

ploughing back a large proportion of their science graduates into teaching, which implies a rapid buildup in the future.

Quality As Well As Quantity

It would be foolhardy to assume that these new Russian graduates are inferior to ours in the quality of their technical training. They start out with much more intensive mathematical and scientific preparation at the high school level. They study harder and longer in college, with more laboratory work and more practical training. Their courses and textbooks seem to be as thorough as ours. Even though the Russian graduates may be overspecialized, they get results.

These results have been striking. The Russians developed both A-bombs and H-bombs faster than we expected, and it's not certain that they had to rely much on espionage. They pushed ahead of us for a while in jet fighter design, and they showed up with a fleet of long-range bombers well ahead of schedule. They are crowding us on nuclear power, electronics and automation. There are grave fears that they have established a lead in the vital field of military rockets.

The goal of Soviet scientific manpower policy includes not only weapon supremacy but also leadership of the neutral and uncommitted areas of Asia, Africa and the Middle East. The Soviet leaders may be bluffing in their offers to export capital, but they are preparing to export Russian scientific and technical know-how in a big way.

How They Do It

The Russians are determined to win the race for scientific supremacy, and they do not count the cost. **They pay their scientists and engineers salaries that seem fantastic when compared with other Soviet incomes.**

Senior professors, research scientists and top engineers are a major segment of the Russian elite. Their incomes are frequently six to ten times the average industrial wage. (In the U. S. six to ten times the average industrial wage would be $25,000 to $40,000 a year.) Housing and other privileges are correspondingly lavish. While preaching equality, the Soviets use capitalistic incentives far more boldly than we do. Indeed, practicing engineers and scientists have been complaining about the exalted status of professors and top research people, and salary scales are now being adjusted to give greater emphasis to practical results.

The Russians are also generous in their aids to education. Tuition has just been made free at all levels. Undergraduates receive 200 to 500 rubles a month and graduate students 800 rubles (about equal to an industrial wage) to cover living expenses. The biggest stipends go to science and engineering students. College students are deferred from military service, and engineers and scientists often enjoy continued deferment even after graduation.

Finally, the Soviet leaders can channel engineers and scientists — and all other human and material resources — into any area they choose. And the areas the Soviet leaders choose are predominantly those that contribute to military or political objectives, rather than to a better life for consumers.

What's Our Answer?

We are certainly not going to adopt Soviet methods. We do not want scientific robots, but free men, able to understand and add to our democratic heritage. At the same time, our world leadership in technology — and perhaps even our survival as a nation — will be threatened if we allow ourselves to lag far behind Russia in the training of scientists and engineers. Ways to keep the United States in the race will be discussed in a later editorial in this series.

This is one of a series of editorials prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

the finisher that has laid a million miles of superior pavement

According to conservative estimates, the thousands of Barber-Greene Finishers throughout the world have started on their second million miles. This million miles has been laid under every conceivable condition, on all types of base, with all types of mix.

The many exclusive features of the Barber-Greene account for this performance record:

Top paving speed: The Barber-Greene will lay any mix as fast as any paving machine now in use with the same surface quality. Widest choice of laying speeds, including the lower speeds needed for difficult mixes, means every job can be done at the maximum speed.

Positive traction: Crawler mounting assures positive traction and steering control even while pushing loaded trucks up steep grades, on slippery primes or on soft bases.

Superior maneuverability: Short length and crawler mounting save valuable time in fast maneuvering or turning around, even in narrow streets or confined areas.

Ease of control: Operator has unrestricted view of truck dumping, material level in spreading screws, and finished mat.

Time-saving hopper: Receiving hopper is amply wide for fast truck changes and easy discharge, without spillage.

World-wide service and parts: Available from local stocks on short notice.

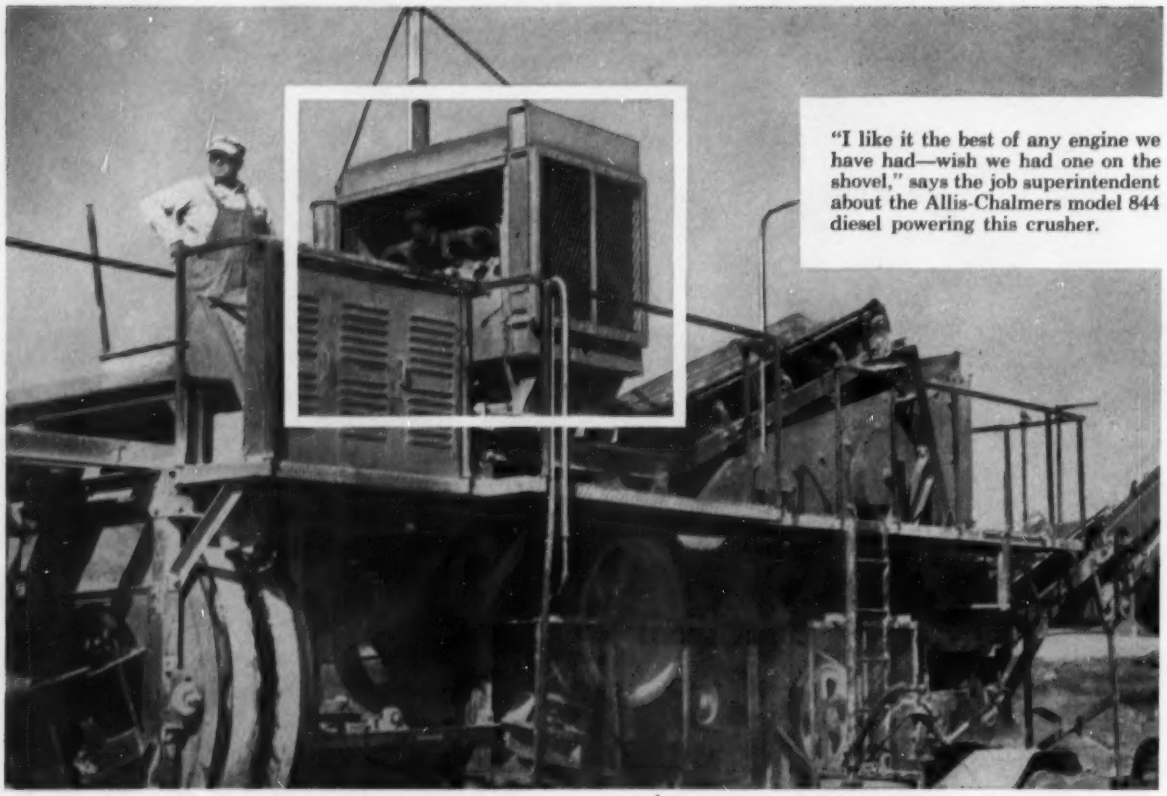
56-14-F

Write for literature on the finisher that handles all your paving jobs at less cost.

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

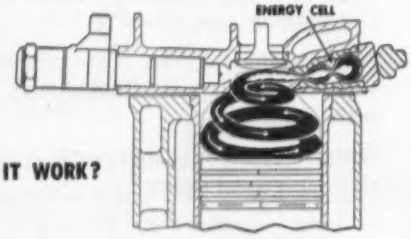
CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT



"I like it the best of any engine we have had—wish we had one on the shovel," says the job superintendent about the Allis-Chalmers model 844 diesel powering this crusher.

WHAT *"Follow-Through"* COMBUSTION DOES FOR YOU

"Follow-Through" combustion describes the way fuel burns in an Allis-Chalmers diesel engine. Because of it, more energy is released by combustion into productive power . . . engines last longer.

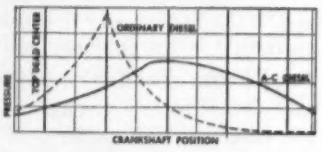


HOW DOES IT WORK?

Fuel is injected into the combustion chamber and into a special *energy cell.* Combustion starts in the chamber and spreads into the energy cell, where it ignites under tremendous pressure and heat. After a split-second delay, pressure from the energy cell creates a cyclone turbulence in the combustion chamber. This atomizes the fuel and provides a thorough fuel-air mixture. This action produces highly efficient burning, builds up combustion pressure slowly and evenly and retains it longer.

BC-3A

ADVANTAGES OF *"FOLLOW-THROUGH"* PRESSURE



This chart compares combustion pressures at different crankshaft positions in Allis-Chalmers and ordinary diesel engines. In ordinary diesels (dotted line), pressure builds up fast, producing a hammer blow shock load while crankshaft is near dead center.

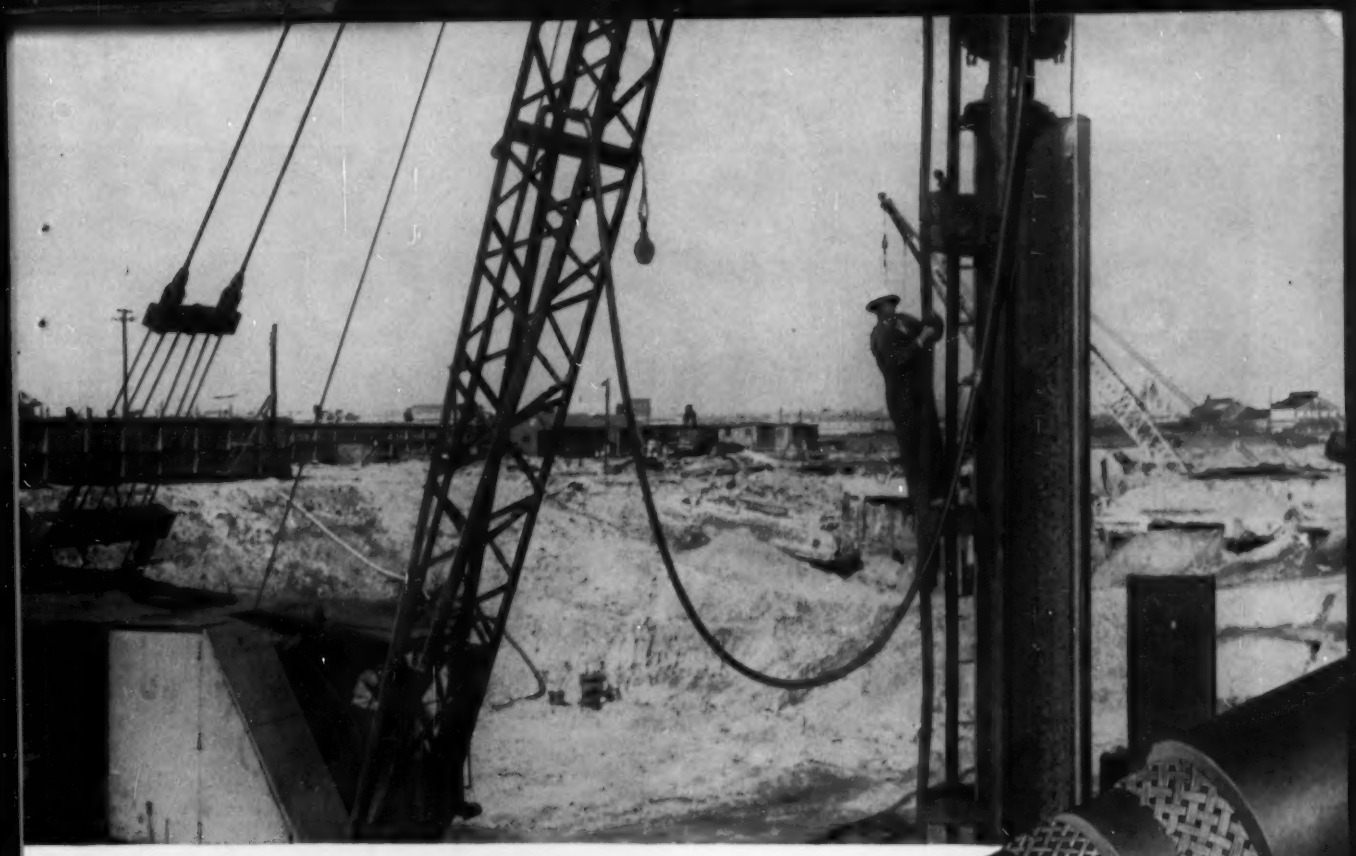
In the Allis-Chalmers engine, effective pressures are sustained over a longer period when leverage on the crankshaft is more favorable. There is more turning force available for work and it is applied against the crankshaft smoothly.

Result: More sustained power, smoother operation, longer engine life.

"Follow-Through" combustion is just one of many things that are "so good" about Allis-Chalmers diesel engines. You can get the full story from your Allis-Chalmers Buda Division engine dealer.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



DOWN TIME...ZERO

Nothing gives hose a worse beating than a pile driver. And here's hose built to take it . . . day in and day out! Thermoid Powerflex Pile Driving Hose has the brute strength that assures longer wear, fewer replacements. *You can forget about down time.* Yet Powerflex is lightweight, flexible, kink-resistant, easy to handle.

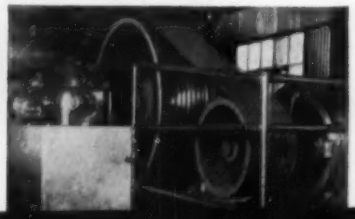
No wonder it's tough . . . look how it's made

- Heat and oil resistant tube.
- High tensile braided steel wire reinforcement prevents bursting . . . gives flexibility.
- Special pattern of the wire braid develops positive lock of tube and cover to reinforcing structure. Mechanically bonded insulating plies assure homogeneous body structure.
- Internal stress of the hose under pressure is completely absorbed by the wire braids, not the insulating plies.
- Tough, specially compounded cover resists abrasion and aging.

Thermoid Powerflex Pile Driving Hose is only one of many types of Thermoid hose built to give the construction industry longer service and lower operating costs. The Thermoid Distributor in your area carries a complete line of Thermoid Hose, Multi-V Belts and Conveyor Belting, to meet the most exacting needs of every job.

Cut costs with Thermoid Conveyor Belting . . .

. . . and Thermoid Multi-V Belts.



Thermoid

Thermoid Company, Trenton, N.J.

Next job is only minutes away with

mobile trencher

Parsons rubber-tired Trenchmobile® runs anywhere at a moment's notice. A job 6 miles away can be started in less than 30 minutes from "now". Trenchmobile drives there cross-town, through traffic at 12.6 m.p.h. . . . digs the trench at speeds up to 14½ feet per minute . . . drives on to next job without delay.

This mobility on rubber is the answer to all those widely-scattered, small yardage trenching jobs where you formerly had to bring in cumbersome, oversize equipment, or use slow, costly hand labor. Trenchmobile is big enough, too, for a lot of main-line excavations. You get trench widths from 8 to 16 inches . . . depths to 5 feet, for water and gas mains, service connections, pipe reclamation, foundation footings, underground cables, lighting systems.

Let Parsons distributor show you how rubber-tired Trenchmobile can put your jobs on a fast "work-and-run" basis. Also check Parsons 5 big sizes of ladder and wheel-type Trenchliners®.

HOLDS ACCURATE GRADE . . . Positive down-crowd on the digging boom starts cut fast, maintains accurate grade. Buckets are high-carbon cast steel. Self-sharpening, easy-in-easy-out "Tap-In" teeth assure top digging efficiency at every width and depth, in all types of soil and job conditions.

BACKFILLS ITS OWN TRENCH . . . Backfill blade (optional) doubles usefulness of the Parsons Trenchmobile . . . lets you do the entire job of trenching and backfilling with one-man, one-machine economy. The husky six foot blade is readily adjustable from straight bulldozing to angled position . . . is raised and lowered by hydraulic control.

• • • • • *Send to:* **PARSONS CO., Newton, Iowa** • • • • •

for literature on 43.6 h.p., rubber-tired Trenchmobile

NAME_____

COMPANY_____

STREET_____

CITY, STATE_____ CME

PARSONS — Quality Pioneering Products

(Rexnord Subsidiary)

DODGES SIDE OBSTRUCTIONS . . . Shiftable, reversible belt conveyor places spoil bank on either side of trench . . . lets Parsons Trenchmobile work in close to buildings, poles, without swerving from grade line.

UNDERCUTS SIDEWALKS . . . With reverse traction and sloping ladder boom, Trenchmobile undercuts walks, curbs, gutters, old mains . . . makes vertical cut-ins, flush against foundation walls. Saves hand work. Hinged crumber swings up, out of the way.

Get 3-tool versatility with Kwik-Mix Moto-Bug®

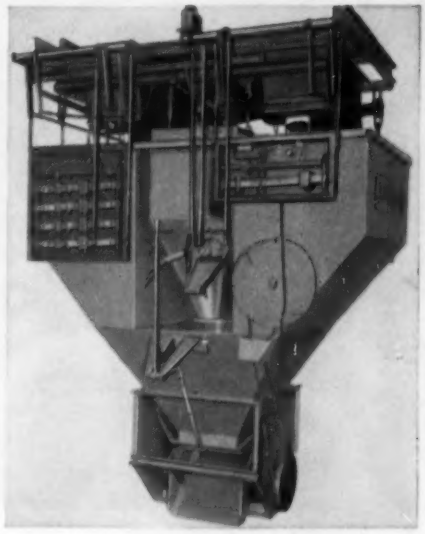
Big R-15 Moto-Bug hauls all kinds of bulk materials in 15 or 18-cubic foot hopper body. Hopper is quickly interchanged wtih 1-ton capacity platform, or ¾-ton (7-foot) fork lift. There's no limit to its usefulness — earns big savings in time and costs. Ask, too, about smaller S-10 Moto-Bug, available with multiple attachments. Kwik-Mix line also includes concrete mixers, plaster-mortar mixers, bituminous mixers — all sizes and types.

KWIK-MIX · Port Washington, Wis.
(Koehring Subsidiary)

Central cement feed prevents "gumming"

With concentric arrangement of aggregates around cement in the Johnson Concentric Batcher, all ingredients are intermingled as they flow through discharge. Reduces dusting, pre-shrinks materials. Cement is weighed individually on precision-beam scale; aggregates on accumulative dial scale or individual beam scales. Johnson Concentric Batcher sizes: 2 to 8 cu. yds., arranged for 2 to 8 aggregates, 1 to 4 types of cement.

C. S. JOHNSON · Champaign, Ill.
(Koehring Subsidiary)



Compare Koehring 205 with any other ½-yard

Crowd, swing, boom-hoist and retract clutches on Koehring heavy-duty 205 are among the largest used in the ½-yard class. Powerful cable crowd and electric push-button dipper trip maintain fast dig-and-dump cycles. Automatic traction brakes simplify operation, lock and hold the 205 when working or parked. *Work capacity:* ½-yd. shovel or hoe; ½ to ¾-yd. clamshell or dragline; 10-ton lift crane on crawlers; 15-ton truck crane.

KOEHRING Company
Milwaukee 16, Wis.

V62

PAVING...How to Get the Best Results

10. Mixed-in-Place Pavements

By Joseph F. Cavanaugh
Seaman-Andwall Corp.
Milwaukee, Wis.

MIXED - IN - PLACE pavements differ from high type pavements only in the filler material used. High grade highway pavements are constructed with manufactured fillers, such as graded aggregates. Mixed-in-place construction takes material already in place, modifies it by adding some missing ingredients, and processes it with a suitable binder.

Some of the more important types of mixed-in-place pavements are soil-cement mixtures, asphalt-soil stabilization, cement or lime mixtures in clay, calcium chloride treatments, salt, and lesser known chemical treatments with such agents as aniline puerferol.

Recently a quaternary ammonium salt made from tallow and called Arquad 2HT has been introduced and shows unusual promise as a binder. And Minnesota & Ontario Paper Co., International Falls, Minn., has conducted experiments with sulphite wastes from paper mills. A test section constructed in plastic soil stood up well under heavy frost penetration for its first two winters in contrast to conventional road surfaces nearby.

Pavement or Base?

Many miles of native soil mixed with portland cement are serving admirably to carry secondary road traffic. Usually these roads have no other surface treatment than a light cover of asphalt and rock chips. Roadbuilders in many areas of the west still use the upper 6 in. of some desert floor material as filler for asphalt binders. If grading is not extensive, construction of these pavements often costs as

(Continued on page 162)

Slash costly pitting and patching

PHOTO COURTESY QUEBEC HYDRO-ELECTRIC COMMISSION

use GLOBE FORM GREASE

for all Concrete Forms

On job after job, engineers and contractors prove continually Globe Form Grease the definite cost-cutter that reduces peeling and pitting to a minimum and practically eliminates patching in concrete work after steel or wooden forms are removed.

The reason is simple, Borne, Scrymser's Globe Form Grease is a time-tested paste emulsion with exceptional adhering qualities applied with spray, brush, or swab. For utmost effectiveness — only a thin coat is required. Consequently one gallon covers approximately 200 square feet! And more — Globe Form Grease is stainless — leaving a smoother, whiter concrete surface without painting.

Prove to yourself why Globe Form Grease is truly the "wonder grease" for every concrete form. Write for full particulars today.

OILS *and* **GREASES** *for every purpose*

DIESEL • STEAM • AUTOMOTIVE

Our Laboratory Facilities are always at your disposal.

BORNE SCRYMSER Since 1874

RUBARITE — New Powdered Rubber for Tomorrow's Asphalt Construction.

BORNE, SCRYMSER COMPANY

ELIZABETH, N. J. • CHARLOTTE, N. C.

PAVING... Continued from page 160

little as $4,000 per mile, including dirt work.

For higher type pavements, exactly the same methods are used to build a strong base for the roadway. Stabilizing native soil with a binder often is cheaper than manufacturing or processing granular aggregates.

More and more state highway departments are using mixed-in-place paving as a planned stage in the orderly, long-range development of their road systems. This type of long-range program begins with the purchase of adequate right-of-way. Alignment of the road is as nearly permanent as funds permit. Horizontal and vertical sight distances take into account future development of the road. Drainage is studied carefully, and grading makes use of the best compaction practices so that good bearing values are developed.

NATIVE granular material mixed with asphalt binder produces economical road pavement.

Then a mixed-in-place pavement is constructed. This road will be strong and durable for traffic up to 200 to 250 vehicles per day—or even more. Last winter such a pavement on U.S. Highway 62-82 in Texas stood the pounding of mainline traffic all winter without a break. And, when traffic warrants further improvement, the mixed-in-place pavement can serve as the base for an overlay of higher type pavement.

Soil Types

A wide variety of soil types are suitable for mixed-in-place paving. Practically all clays and alluvial sands and gravels can be mixed with suitable binders to create strong mats with high bearing values.

Granular sands and gravels, such as those in alluvial fans over much of the west, respond to asphalt or cement treatment. Clays and silts blend well with cement.

The Texas State Highway Department has even found a way to stiffen soapy marl with a plasticity index as high as 50. The addition of 5 to 10% lime lowers the PI to 10 or below. The California Division of Highways has brought granular material with dangerous amounts of plastic clays down to a safe PI level by adding as little as 2% by volume of cement.

(Continued on page 165)

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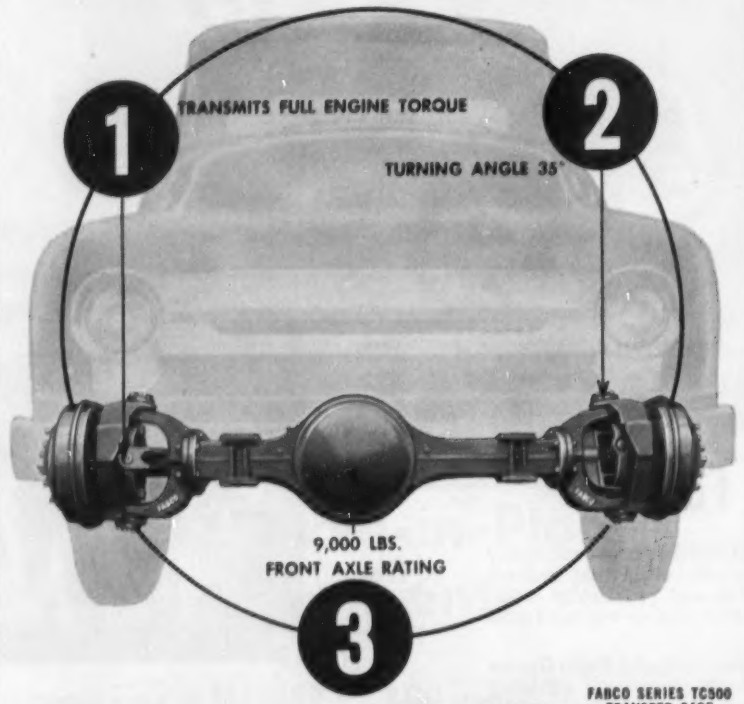
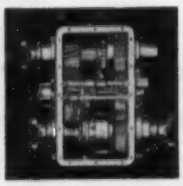
FRONT WHEEL DRIVE

"CARRIES A FULL LOAD AT TOP SPEED EVERYWHERE"



ENGINEERED CONVERSION
FOR ALL MAKES OF
MEDIUM DUTY TRUCKS



FABCO SERIES TC500 TRANSFER CASE

- For 4x4, 6x4 or 6x6 operation
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- Equipped with full engine torque P.T.O. outlet
- Incorporates deep underdrive ratio 2.23 to 1 for maximum pulling off-highway traction

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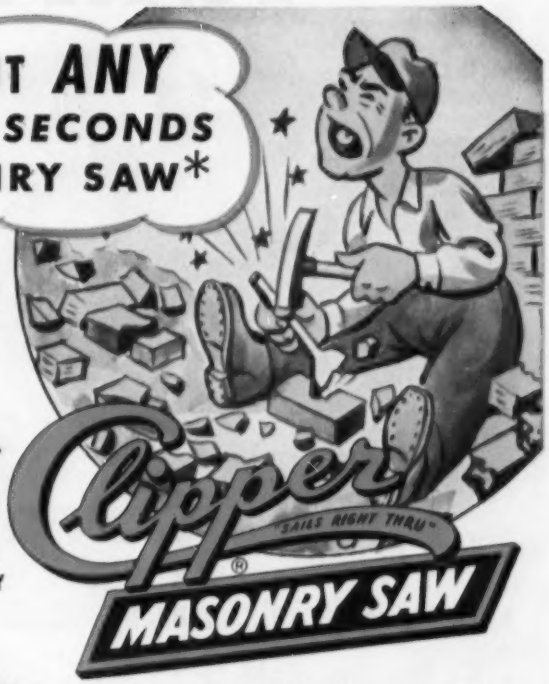
*...and at the Lowest Cost per cut!

The FIRST and still the FINEST MASONRY SAW



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Wet or Dry Cutting
A Model to fit every Budget, priced from $265

Select The CLIPPER BLADE DESIGNED FOR YOUR JOB

New Triple-Reinforced BREAK-RESISTANT BLADES

Triple-Reinforced . . . in specifications to cut every masonry material . . . HARD to SOFT. Another CLIPPER FIRST! Polk-A-Dot design reduces side friction, delivers maximum power to cutting edge. Break Resistant — safer — lower cost.

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Hard — Soft — Porous — Dense . . . Wet or Dry there's a special Clipper Abrasive Blade to cut any masonry material, faster, better with guaranteed lower costs. Clipper quality is your Best Buy.

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Clipper sells more because Clipper sells Quality. Blade after blade, on tile to block, Clipper Diamond Blades outperform, outcut and outlast any other blade. Dependable . . . consistent quality.

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Order YOURS — TODAY — and discover for yourself how a CLIPPER will pay for itself in increased profits — from increased production at lower cost! CLIPPER'S "On-The-Job" FREE TRIAL guarantees satisfaction at no obligation!

ONLY Patented Features such as these make Masonry Sawing Economical! "Select-A-Notch" — Pressure Equalizer Spring — Wet-or-Dry Pump and Water Application . . . features found ONLY on Clipper Masonry Saws!

WHY "4 OUT OF 5" Buy Clipper Blades . . .

Manufactured under the most advanced Quality Controls known to the industry. Consistent quality . . . peak performance . . . Rim to Stub . . . Blade to Blade.

by the Makers of **CLIPPER MASONRY SAWS and CLIPPER CONCRETE SAWS**

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A SPACE-SAVING, READY-TO-GO

125 hp
TWO-STAGE AIR-COOLED
MOTORCOMPRESSOR

- Easy to install
- No water jackets or piping
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- Air cooled intercooler
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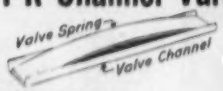
- I-R Channel Valves

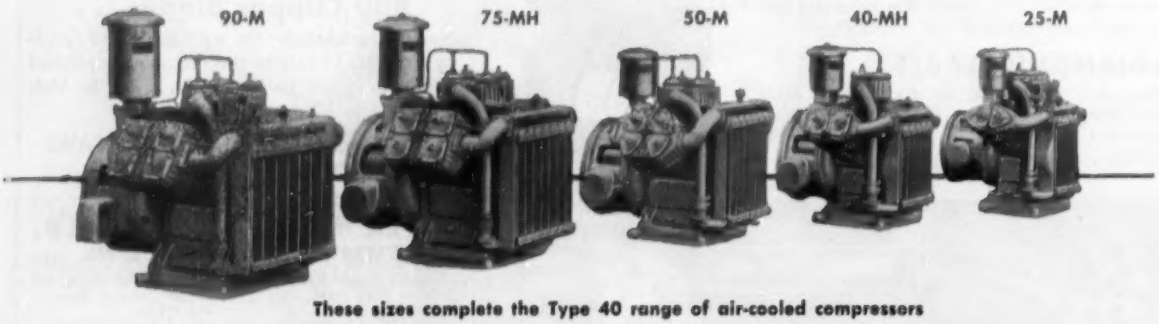


High Efficiency
Quiet Operating
Exceptional Durability
Entirely Different
Stainless-steel Channels and Springs
Air-cushioned action
Found only on I-R compressors

Newest addition to the Ingersoll-Rand line of Type 40 compressors, this heavy-duty, air-cooled unit offers new convenience and economy for the generation of 80-125 psi air power in the 125 hp class. Shipped fully assembled, its compact, well-balanced design and small foundation requirements cut installation costs. And efficient two-stage compression with intercooling to near ambient temperature, reduces power costs all year around.

Choice of constant-speed control, automatic start-and-stop control and manual or automatic dual control affords the most efficient capacity regulation for your particular operating requirements.

For complete information on all the time-saving, cost-saving features of this 125-hp Motorcompressor, send today for your copy of Bulletin 3188.



These sizes complete the Type 40 range of air-cooled compressors

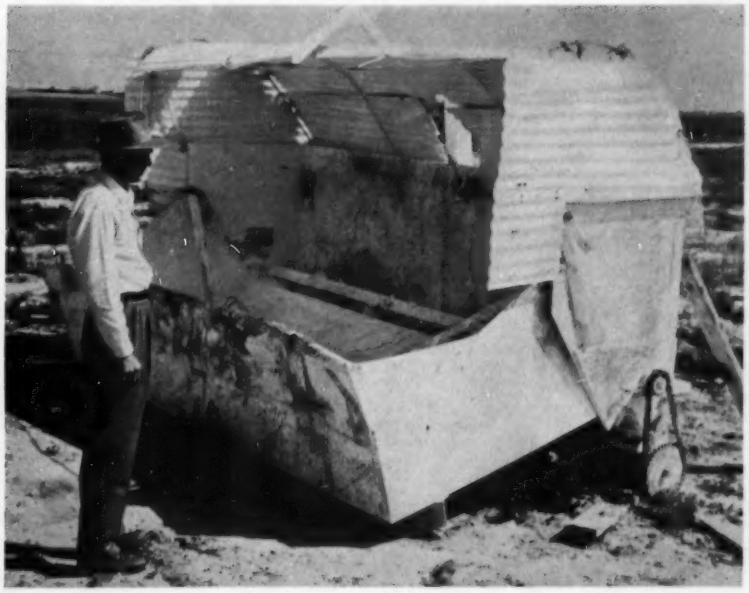
Ingersoll-Rand

I-403

11 Broadway, New York 4, N. Y.

COMPRESSORS • GAS AND DIESEL ENGINES
ROCK DRILLS • PUMPS
TURBO-BLOWERS • AIR AND ELECTRIC TOOLS

PAVING . . . Continued from page 162



LIME-SPREADING BOX, job-made by Texas contractor, helps reduce plasticity index. Texas State Highway Department adds from 5 to 10% lime and lowers index to 10 or below.

In the sandhill country near North Platte, Neb., and in the area around Yuma, Ariz., even a jeep will mire down hopelessly in the soft sand. Yet the highway departments of these states have found ways of building excellent pavements with this material. All they do is add about 15% of minus 200-mesh fines to fill the interstices between round sand particles. Then they mix in 5 to 6% of asphalt, either RC or MC-3. Laid out and compacted, these pavements give excellent service as secondary roads.

Equipment

Excellent equipment to construct mixed-in-place pavements rapidly and at low cost is available. Several manufacturers produce equipment that has been thoroughly tested and will produce uniform results.

Mixers may be self-propelled or towed; they may be mounted on rubber-tired wheels or on crawler tracks. One integrated unit with a 7-ft working width makes use of a wheeled tractor. It is fitted with pumps and metering equipment for adding water or asphalt and carries a mixing chamber and hood at the rear.

A heavy-duty rotor in the mixing chamber can be equipped with various types of mixing tines for different materials. Travel speeds range up to about 250 fpm, and several mixing speed ranges are available. This equipment can mix lifts of up to 12 in., usually in two passes. And it can work with filler material flat in place; windrowing and leveling machinery are not needed. Rolling and "tight blade" dressing by motor grader finish jobs mixed with this equipment.

Another integrated mixer, on crawlers, incorporates multiple rotors and pugmills inside a rear hood. Water and bitumen are added through spray bars within the hood, and processed material is spread out flat through an adjustable tail gate.

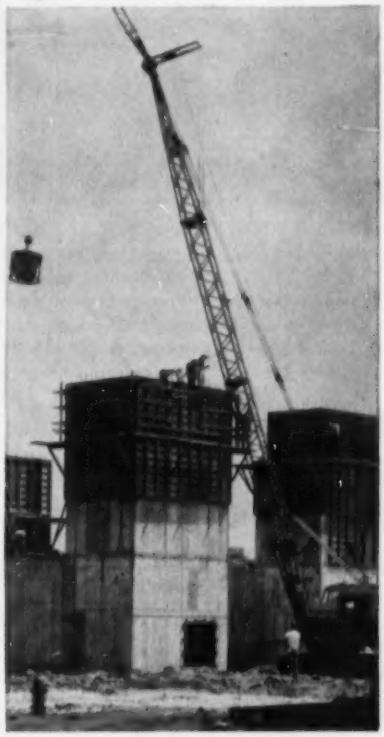
A traveling pugmill, either self-propelled or towed, is still another type of mixer. It picks up a windrow of filler or granular material with pickup wings and apron and feeds it through the pugmill where heavy rotating paddles do the mixing. The finished mix is left windrowed behind the machine to be leveled and rolled in the usual manner. This type of equipment, like those mentioned earlier, is equipped to meter water, asphalt, or chemicals and is designed to do its work at a gravity point close to the road surface.

Still another type of mixer is a machine that picks up a windrow of material with an elevating bucket line, dumps it to a pugmill mounted several feet above the

(Continued on page 168)

(Advertisement)

Symons FIELD REPORT...



SYMONS FORMS USED ON TWA TEST CELLS ...

Five aircraft engine test cells, with exhaust and intake stacks 45 feet high, are being erected at Trans World Airlines' overhaul base at Mid-Continent International Airport, Kansas City, Mo.—the first cells of their kind in the United States.

These cells are on a concrete base, and 12,500 square feet of Symons Forms with Steel Cross Members were used for the 55,000 square feet of concrete forming required. Sharp Brothers Contracting Company, Kansas City was the general contractor.

TWA test cells are just one of many commercial, industrial, institutional and public works construction jobs for which Symons Forms are adaptable. Symons engineering staff gives complete service on the details of all forming jobs. Our salesmen are field-trained to give practical advice on form erection, pouring and stripping methods.

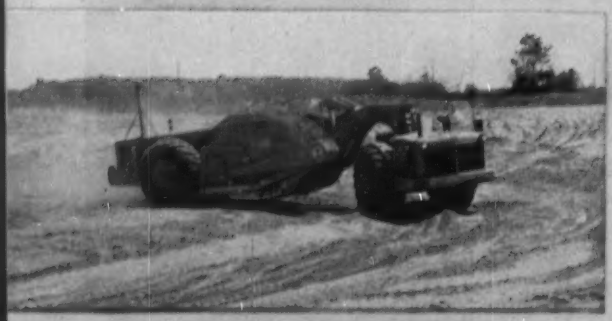
Symons Forms, Shores and Column Clamps may be rented with purchase option, rentals to apply on purchase price. Symons Clamp & Mfg. Co., 4255 Diversey Ave., Dept. F6, Chicago 39, Ill.

In this unusual stripping procedure, panels are being removed by a worker seated in a bosun's chair suspended from a crane boom.

Catalogs and Added Information on FORMS—CLAMP—SHORES sent on Request

Small job or Big project...

On this Florida Turnpike contract of Blythe Bros., two TS-18 "Eucs" loaded, hauled and dumped in sandy conditions that "hung up" other equipment. The tremendous power and traction of this Euclid scraper, and its easy operation, made the "Twin" a logical choice for this tough job.

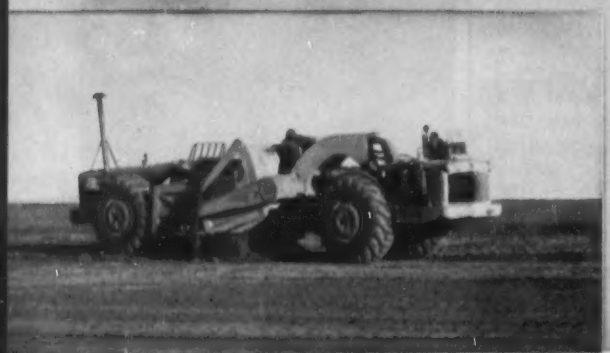


Western Contracting Corp. owns 15 of these TS-18 Euclid Scrapers . . . they used 12 of them on a 7 million yard Indiana Turnpike contract and now have 10 of their "Twins" at work on Oahe Dam in South Dakota. Western's scrapers are equipped with top extensions that add 6½ yds. to the bowl capacity . . . have a total of 518 h.p.—a 300 h.p. engine in the tractor and 218 h.p. for the scraper wheels.

EUCLID TWIN-POWER in the TS-18 provides more work-ability than you get in any other scraper

Twin-Power—the use of two engines driving separate axles—was pioneered in the earth moving field by Euclid 10 years ago. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power matched to all job conditions. One of Euclid's newest scraper models, the TS-18 uses power and drive components that have proved their dependable performance in other "Eucs" on hundreds of jobs.

The TS-18 is powered by two 218 h.p. engines—one in the tractor and another behind the scraper bowl. For work where even more power can be used, a 300 h.p. engine for the tractor is available. Both engines drive through separate Torqmatic Drives. Standard tires are 27.00 x 33 with 33.50 x 33 available as optional equipment.



Harris Construction Co. recently set a new record for earth moving on Montana highway work with six TS-18 "Eucs". . . moved 90,000 yds. in a single week, working 10 hours a day. The scrapers self-loaded and hauled an average of 2,000 ft. This contractor is also using his "Twins" for grading and construction of runways at nearby Glasgow Air Base.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

this TS-18 "Euc" *cuts earth moving costs!*

VERSATILITY
for a wide range of work!

The TS-18 is the most recent development of the Twin-Power principle pioneered by Euclid and job proved in earlier scraper models. Its unequalled power and traction gets more work done . . . sets a new standard for low cost scraper yardage. Self-loading in practically any material from loose sand to hard shale, the TS-18 is a one-man earthmoving spread. It works on steep grades and under job conditions that stymie other self-powered scraper equipment.

Hydraulic lever action does away with cable headaches and expense. All scraper operations—bowl, apron and ejector—are independently controlled. All four of the hydraulic jacks are interchangeable . . . one spare fits anywhere. The low, wide bowl design and reversible four-section cutting blade make the TS-18 easy to load . . . heaped loads up to 24 yds. are picked up fast.

Like all other Euclid Scrapers, the TS-18 is built to stay on the job with less down-time for servicing and repair. All major components are readily accessible . . . a feature that really pays off in more work-ability and lower maintenance cost. Your Euclid dealer has facts and figures showing why owners everywhere say that ***Euclids are your best investment.***

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

MIXING TINES swirl material in chamber of Seaman-Andwall Pulvi-Mixer. Pumps and metering equipment add water or asphalt during mixing. Rig can travel up to 250 fpm.

road, and passes the mixture by gravity back to the highway as the machine moves along. Leveling, blading, and rolling equipment are needed to finish the mat.

Finally, of course, there is the motor grader. Probably more miles of secondary road pavements have been mixed out by motor graders than by any other method. But motor grader mixing is beginning to disappear now for several reasons.

First, mixing action is limited to a single roll along the blade, and the mixing time is so short that the mixture produced cannot compare to the more intimate blends developed with other equipment. Second, it is necessary to lay out construction sections at least 1,000 ft long, whenever possible, to reduce equipment turning time. This tends to cause more interruption of traffic than mechanical mixing. Finally, the first two reasons encourage the natural human tendency to lay the mat down before a proper degree of blending.

In purchasing this type of equipment, contractors should consider these factors:

- *What is the initial cost?*
- *What is the equipment's potential in terms of cubic volume per shift?*
- *Will it deliver mixtures acceptable to the engineer?*
- *Will it require auxiliary equipment?*
- *What will be its probable maintenance cost, and what maintenance facilities are available near the job?*
- *Does the manufacturer have trained field engineers available to*

(Continued on page 173)

THIS ADVANCED DESIGN **POWER BUGGY**

operates like an automobile

TELESCOPING VIBRATORY SCREED

No beam overhang. Quickly adjustable length (to nearest fraction of inch), fits any form width. Shoe-plate NEVER rides the forms.

ASK FOR BULLETINS

- LESS OPERATOR FATIGUE
- REQUIRES NO OPERATOR TRAINING
- INSTANT FORWARD TO REVERSE
- TRAVELS 17 M.P.H. EMPTY
- DRIVE WHEELS UNDER LOAD
- TURNS IN ITS OWN LENGTH
- SAFETY LATCHED BRAKE PARKING
- MULTI-DISC DOUBLE OIL TYPE CLUTCH
- AUTOMOTIVE TYPE DIFFERENTIAL

Pats. Applied For

13½ CU. FT. HEAPED LOAD
GROSS WT. EMPTY 850#

UNEQUALED RAMP MANEUVERABILITY

EASTERN REPRESENTATIVE
Earl H. Pence
403 Oak Lane
Baltimore, Maryland

BETTER EQUIPMENT FOR PLACING AND FINISHING CONCRETE

POWER BUGGIES • TELESCOPING VIBRATORY SCREEDS • ECONOMY VIBRATORY SCREEDS • ROLA PAVERS AND TRENCH BOXES • WOOD AND STEEL TILT-UP HARDWARE • BULL FLOATS • HOPPERS • BUCKETS • ELEPHANT TRUNKS AND CHUTES • TAMPERS • HAND CARTS

NON-STALLING
Can stop, park on safety lock brake, then pick up its load and resume climb.

1450# on 35% grade
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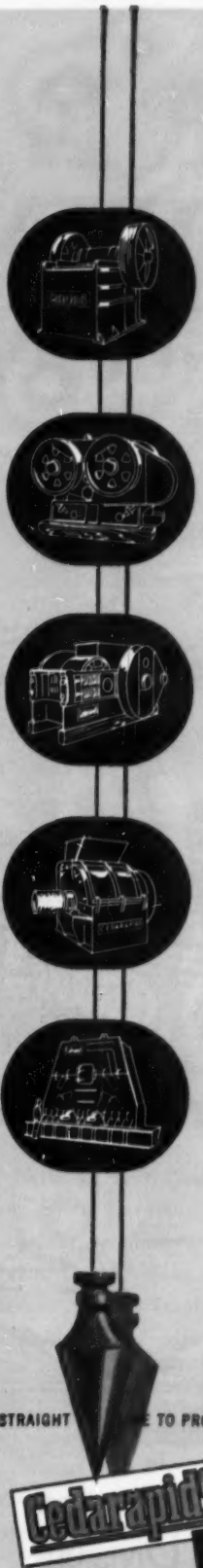
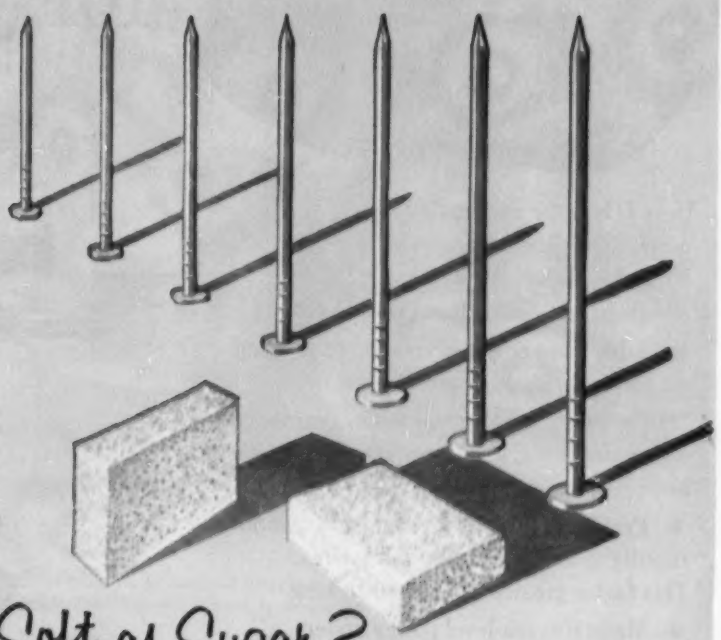


HARD AS NAILS



or Soft as Sugar?

Cedarapids can crush it!

Granite, traprock, slag, chalk . . . there's a Cedarapids crusher built to handle it profitably!

Whatever operating conditions face you . . . whatever your specification requirements or tonnage demands . . . Cedarapids complete line of crushers, screens, feeders, conveyors . . . or portable plants . . . meet your needs for big-volume production at low cost.

Write us about your problem. Construction-wise Cedarapids engineers can help you solve it.

YOUR STRAIGHT [illegible] TO PROFIT

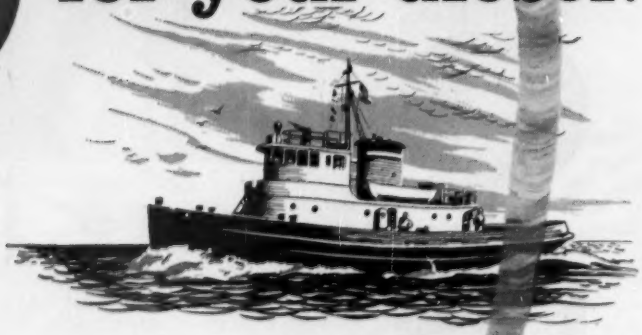
Cedarapids — Built by IOWA

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

Manufacturers of the most complete line of aggregate producing and bituminous mixing equipment.

MORE DRIVE

for your diesel!



Here is how the application of AiResearch Turbochargers can affect the performance of your mobile or stationary diesel equipment:

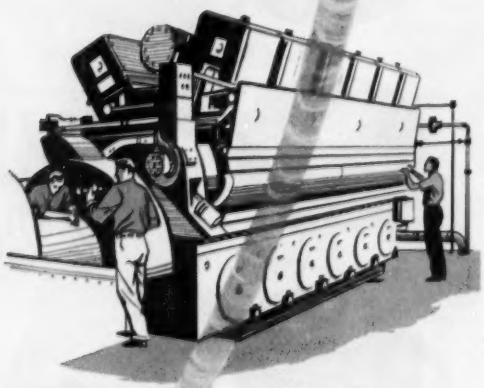
✶ Adds more power in relation to size and weight than any other units in this field.

✶ Decreases fuel consumption. Besides decreasing costs, this factor greatly increases the non-refueling range for mobile equipment.

✶ Provides power as needed by responding rapidly to acceleration requirements. This factor greatly decreases smoking.

✶ Maintains sea-level power under all altitude conditions.

✶ Greatly reduces the noise level of your equipment while eliminating power-wasting mufflers.



AiResearch is the largest producer of small turbomachinery in the United States. Twenty-five *million* hours of experience in deriving exceptional power from small units is the background for the development of the AiResearch Turbocharger. This power package was recently applied to Caterpillar diesel machinery with startlingly effective results.

Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

Two of the fleet of 28 Euclid 46TD 22-Ton Dump Trucks equipped with Fuller 10-F-1220 Transmissions, and operated by Nello L. Teer Company, Durham, North Carolina.

Fuller 10-Speed Transmissions handle Teer's tough hauling assignments

The Nello L. Teer Company of Durham, North Carolina, handles tough hauling assignments with Euclid 22-Ton Dump Trucks equipped with Fuller 10-F-1220 Transmissions.

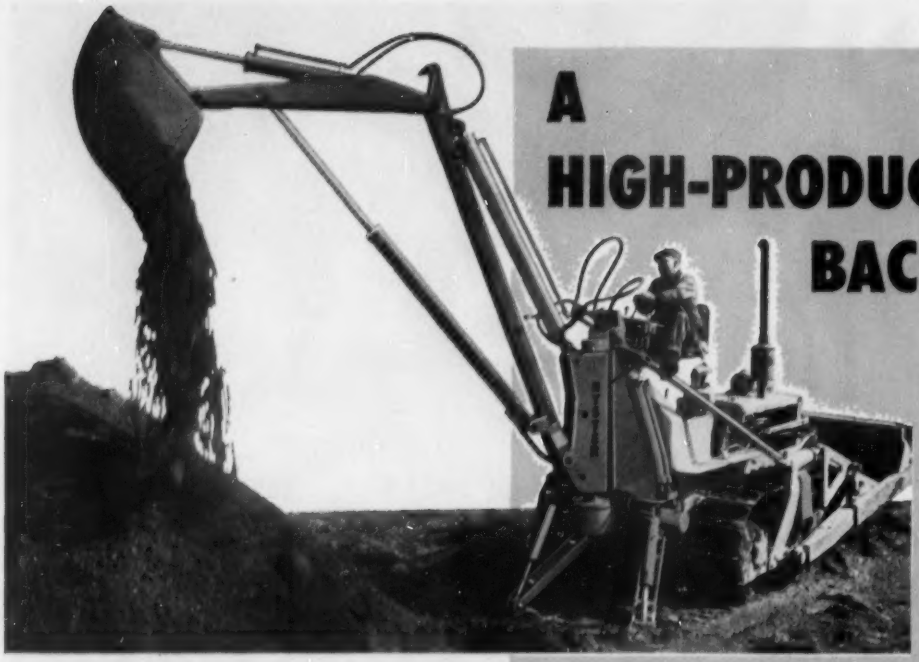
On the boulevard construction job shown above, approximately 3,000,000 yards of dirt and rock were removed to add 80 feet to the present highway along Ohio River bluffs so steep that in many places a triple-bench system was necessary.

Says George Walker, Teer's Master Mechanic: "The heavy-duty Fuller Transmissions paid off in much faster work cycles. We get more work time and less downtime through the right gear ratios provided by Fuller to meet load and grade with shorter, easier shifts."

More equipment owners and users specify Fuller than any other transmission. From the 110 models, semi-automatic and full-manual control, for trucks from 100 to 400 hp, engines from 330 to 1440 cubic inches, select THE Fuller Transmission designed to do your job better and at less cost . . . ready to help you move more for less. Check with your local truck dealer for the *right* Fuller Transmission for your job.

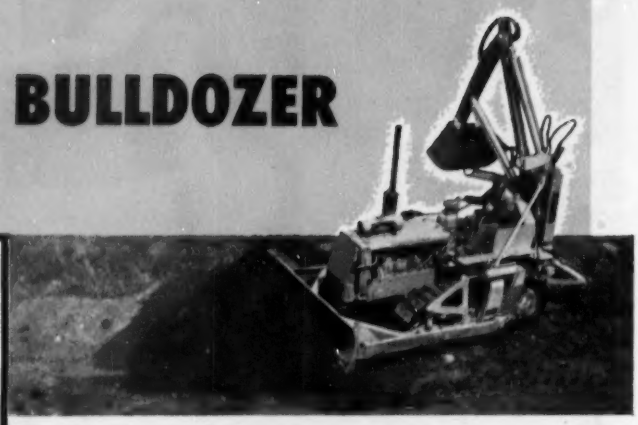
FULLER MANUFACTURING COMPANY
TRANSMISSION DIVISION • KALAMAZOO, MICH.

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.



A HIGH-PRODUCTION BACKHOE plus BULLDOZER

- 3 Dippers Available — 13″, 21″ and 29″ cutting widths
- Digs to 13′ 6″
- Loads to 9′ 7″
- 240° Swing
- Retractable Hydraulic Outriggers
- Convenient Controls
- Full track oscillation



More jobs are
"One-Machine" Jobs for the

HYSTER HYDRAULIC D4 BACKHOE

Designed specifically for the
Caterpillar* D4 Tractor

One machine does all these jobs:

- Clears the way to the job site
- Clears and rough grades the area
- Levels its own footing for accurate digging
- Trenches for water, sewer and gas lines
- Excavates for fuel tanks, septic tanks and foundations

HYSTER COMPANY

THE HYSTER D4 BACKHOE
MAKES MORE JOBS
"ONE-MACHINE" JOBS

All these add up to one point:

You get more work out of *one* machine and reduce your operating costs. For details write for Form 1437 to Hyster Company, 2921 N.E. Clackamas St., Portland 8, Ore., or 1821 N. Adams St., Peoria 1, Ill.

Your Caterpillar Dealer will show you how the Hyster D4 Backhoe will increase the work capacity of your Caterpillar D4 Tractor.

*Caterpillar is a registered trademark of the Caterpillar Tractor Co.

PAVING... Continued from page 168

instruct operators and iron out operational details?

- *Does the equipment have other uses so that it will have a place in other types of highway or dam construction?*
- *Will it be possible to rent the equipment between jobs?*
- *How much will weather conditions affect its use? Can it moisten dry materials and aerate wet ones?*

Cement Soil Stabilization

Soil-cement is one of the most generally used types of mixed-in-place paving. It is particularly economical and convenient in areas where the soil is clay or silt and native deposits of gravel or rock are scarce.

A speedy, orderly operation is fundamental to good soil-cement paving. Not more than 30 min should elapse between initial mixing of soil, Portland cement, and water and compaction. There is a close relationship between the compacted density of soil cement and its ultimate bearing strength, assuming that the cement ratio and the soil type remain constant. The tighter the particles are squeezed together, the more firmly the cement will lock them in place. And when the cement begins to set, compaction becomes progressively more difficult.

Design of soil-cement pavements must be worked out in advance in a laboratory. All the contractor has to do is apply the specified percentage of cement rapidly and within about 1% of total accuracy.

The mixing procedure also should be planned in advance. If a dry mixing pass is necessary, it should be planned so that water trucks do not hold up the operation. If wind is a factor, the mixing equipment should move up tight against the cement spreading equipment. On the other hand, if the soil is wet, it should be aerated to a safe point before the cement is applied. One advantage of soil-cement is that soil a little too wet can be mixed with dry cement and brought out to the optimum moisture content without aeration. The dry cement soaks up excess moisture.

To avoid delays, the contractor should be sure he has an adequate supply of cement and dependable delivery facilities. He also must take into account the possibility that a sudden rain while the ce-

(Continued on page 176)

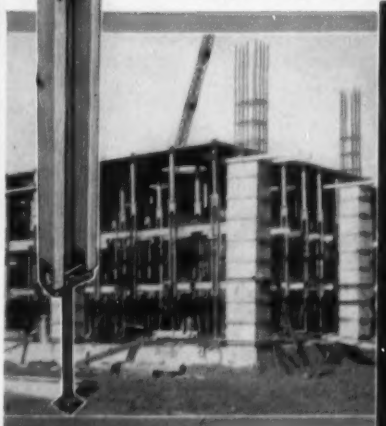
PORTLAND CEMENT is applied by Hercules spreader attached to rear of truck. Soil-cement paving requires careful advance planning to avoid delays and production losses.

BALANCE IN YOUR FAVOR!

WITH ROOSHORS

You can increase your earning capacity per man-hour with the "one-man" ROOSHOR, extension type. This new ROOSHOR, extension type, actually gives you three shores in one . . . a *flat-head* shore, a *male-head* shore and an *extension* shore, by merely inserting any length 4 x 4 in the steel head. And, when bracing is needed, ROOSHORS make it easier with wooden upper members . . . no accessory clips needed.

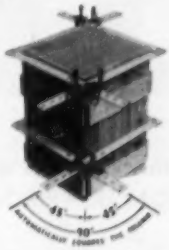
Since 1916—the leader of adjustable shores!



ROOS COLUMN CLAMPS

. . . for greater speed and economy in column forming • two identical units • open either way • larger bars • no loose parts • only a hammer is needed • cannot be put on wrong.

Rooshors and *Roos Column Clamps* are available for rental with purchase option from warehouse stocks in principal cities. Write for Bulletin 456.



MAIL THIS COUPON TODAY

BAKER-ROOS, INC. CM
P. O. Box 892, Indianapolis 6, Indiana
Gentlemen: Please rush additional information on Rooshors and Roos Column Clamps without obligation.
Name_____
Company_____
Address_____
City_____ State_____

Only a VIBROmatic® can create pavements *like this*

● Here you see a bituminous mat that is so smooth, so compact, so uniformly dense, and with so few voids that it exceeds highway specifications with "miles" to spare.

Pavements like this have been made possible through Pioneer's development of the *vibromatic* principle by which an oscillating screed and vibrating compactor work in conjunction.

The VIBROmatic oscillating screed is actually a toothed strike-off bar which meters out the material and precompacts it, filling in voids across the entire width of the mat.

The job is finished by the heated compactor, vibrating at 2000 cpm, which leaves a smooth-finished mat of uniformly high density throughout its entire width and depth.

Other features which help make the new PIONEER VIBROmatic the Paver of the Future:

OPERATING SPEED AND CAPACITY

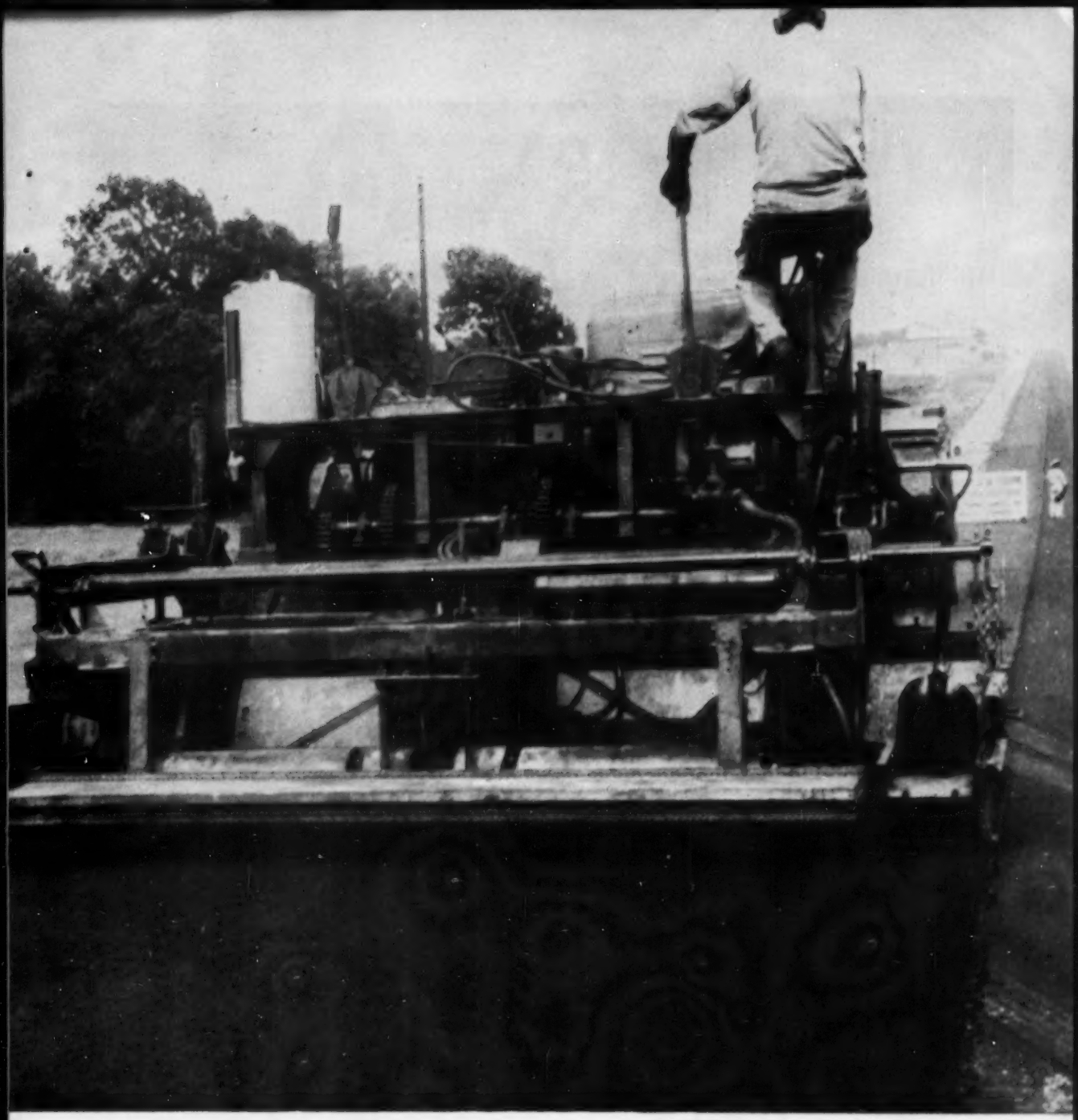
The VIBROmatic has abundant reserve power and 7 operating speeds. It has laid smoother, better quality 12′ mats, 2″ thick, at 66′ per minute than conventional pavers can lay at half the speed. Furthermore, the VIBROmatic Paver can travel at speeds up to 2.65 mph.

LESS MANPOWER . . . LESS ROLLING

Because of the VIBROmatic's unusual ability to lay straight edges at all speeds, it calls for less handwork for raking, edging, patching, etc. Better initial compaction and fewer voids require less rolling. Job reports say one full pass of the light roller is often eliminated.

DEPTH AND CROWN ADJUSTMENT WHILE MOVING

Two screws control setting of depth adjustment through positioning of oscillating screed. Infrequent readjustment required even on comparatively rough subgrade. Crown can be quickly and accurately adjusted from ½″ negative to 2½″ positive while paver is operating.



MAINTENANCE IS GREATLY SIMPLIFIED

Simple design greatly reduces time needed for lubrication and other preventive maintenance. Special attention has been given to accessibility and easy removal of wearing parts. Simplicity of extension and cut-off attachment design permits quick, snappy installation and removal.

EASY-TO-OPERATE CONTROLS FOR OPERATOR COMFORT

Finger and toe-tip hydraulic controls of feeding and steering cut operator fatigue and easily make the VIBROmatic the easiest-to-operate paver on the market. Operator has complete visibility of entire hopper, screw, screed, mat, and the pointer on the line being laid.

Copyright 1955 Pioneer Engineering Works, Inc.

These are only a few of the outstanding features of the revolutionary new VIBROmatic . . . the Paver of the Future. For further information, write or call Pioneer Engineering Works, Inc., Minneapolis, Minnesota (subsidiary of Poor & Co., Chicago) or your nearest PIONEER Distributor.

Pioneer

VIBROmatic®

BITUMINOUS PAVER

HOW TO HANDLE
WET JOBS

96 IN. DIAMETER MAIN
FOR BETHLEHEM STEEL

Sparrows Point, Md.

Contractor: C. J. Langenfelder & Son

WELLPOINTS SPEED PROGRESS
TO 160 FT PER DAY

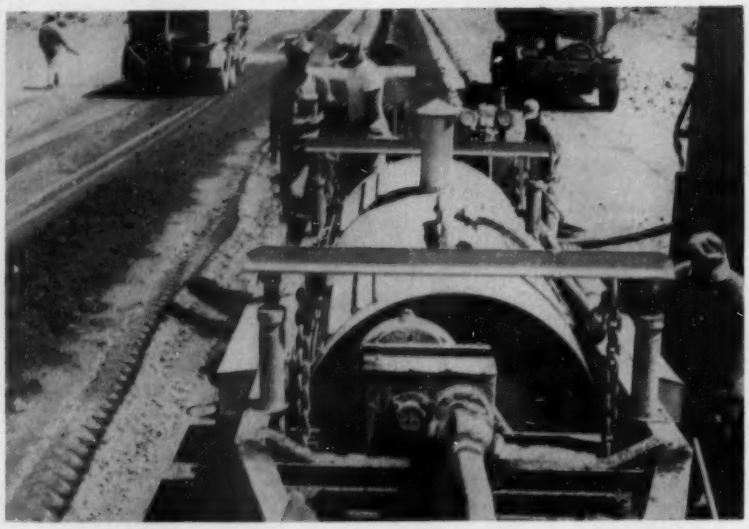
WITH ERRATIC SOIL conditions throughout the project, many problems beset the contractor installing this big steel waterline.

• Some of the tough ones fell to Griffin Wellpoint supervisors. Continual changes of soil formation demanded new solutions all the time, and made dewatering a constant obstacle race. Quick, accurate on-the-spot decisions gave the contractor dry trench—*fast*—thus enabling him to push the pipeline through 4½ miles of stubborn ground at the remarkable progress rate he achieved.

• Next time ground water gets in *your* way, it will pay you, too, to get in touch with Griffin.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

PAVING... Continued from page 173



TRAVELING PUGMILL of Pettibone-Wood machine picks up windrowed material feeds it through mixing chamber, and windrows it behind. It meters asphalt chemicals, or water.

ment is in transit might make it impossible to use the material that day. It is desirable to have some temporary storage facilities near the job or delivery trailers that can be left on the job for short periods of time.

After compaction, the surface of the soil-cement pavement should be shaved to a smooth finish. It's a good idea to use survey blue tops on 50-ft centers along with the experienced eye of the best motor grader operator on the payroll. A contractor often is judged more by the surface finish he leaves on a pavement than by other, more important, criteria.

During final blading stages, the surface of soil-cement pavement should be sprinkled lightly and a seal of asphalt or other acceptable material applied promptly. Efficiency demands the unimpeded flow of equipment along the job to deliver and apply these materials.

Asphalt-Soil Stabilization

Working with asphalt as a binder is a little trickier. In the first place, it is much more vulnerable to rainy weather. Asphalt binders usually are specified only in relatively arid climates. Even there, jobs can hang up for days or weeks while the filler material dries out. Maintenance men frequently use Nostrip or some similar additive to fuse asphalt and filler, but on most new construction the contractor is held to maximum moisture tolerances. Where specifications hold the moisture content of filler soil to 3%, there are no short cuts available.

In the second place, asphalt mixes usually require some alteration of the native soil. In most cases, the contractor must haul in and process some carefully selected missing soil ingredients.

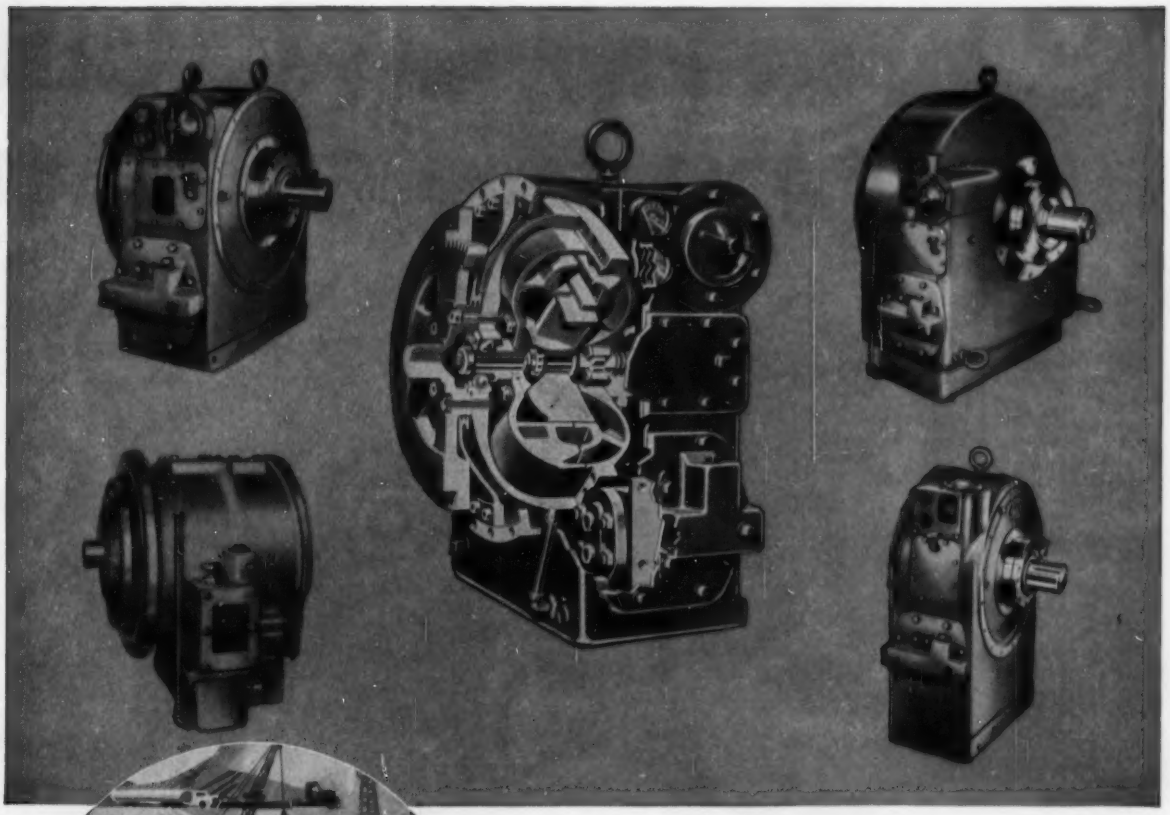
The contractor also must exercise excellent judgment to allow just the right amount of time for volatile oils to evaporate from bitumen mixes before the laydown and rolling. Laying a mat before the volatiles evaporate makes it so plastic that it will distort under traffic. Waiting too long after volatization, or mixing the filler and binder materials inadequately, sometimes causes balls of bitumen to form. When this happens, mixing is next to impossible with any equipment.

But asphalt binders also have their advantages. Delivery usually is fast and dependable because most refineries either have their own insulated tank trucks or have arranged to rent them. Wind is not the problem with asphalt that it is with cement. And the more granular soils usually combined with asphalt are more easily aerated so that the moisture condition can be whipped, if there is a will to do it.

Salt Soil Stabilization

All-weather roads can be built by adding salt to well-graded gravel, crushed aggregate, or native soil. Upon mixing, the salt forms a solution that lubricates the mass to improve its workability. The result is better density and

(Continued on page 180)



For your power need, *whatever it is,* there's a "right" TORCON Model

With a horsepower range from 15 to 600, and fly-wheel diameters from 11 to 26 inches, Torcon has a model that's right for your need—a standard unit available immediately for original equipment or for field installation.

Your real benefits begin after Torcon is installed—

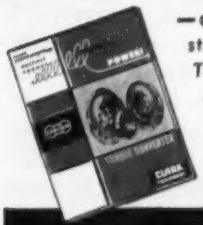
- **more work and less wear: Torcon blade design balances engine efficiency and horsepower through the working range—smooth, shockless power that reduces wear, prolongs life**
- **integral unit includes oil pump, sump, pressure regulator; much better efficiency with minimum maintenance**

Are you constantly on the look-out for ways to get more efficient power at less cost? Talk to Clark—on all problems of power transmission, from flywheel to point of torque application. You'll find, as do many leading equipment manufacturers, that it's "good business to do business with Clark".

CLARK EQUIPMENT COMPANY, Transmission Division
Falahee Road • Jackson 6, Michigan

Other Products of the Clark Automotive Division . . . TRANSMISSIONS • AXLE HOUSINGS • TRACTOR UNITS • TORCON TORQUE CONVERTERS • ELECTRIC STEEL CASTINGS • GEARS and FORGINGS • FRONT and REAR AXLES for TRUCKS, BUSES and OFF-HIGHWAY EQUIPMENT.

SEND FOR THIS TORCON BULLETIN



—a concise, helpful statement on how Torcon installations cut operating costs, prolong equipment life.

CLARK® EQUIPMENT

Here's why Allis-Chalmers higher rate of production -

HD-21
204 net engine hp (torque converter drive)
approx. wt (as illustrated) 53,400 lb

HD-11
85 belt hp
approx. wt (as illustrated) 24,600 lb

Advanced basic design makes the difference; look at these specific on-the-job advantages:

All-Steel Backbone for long tractor life. Exclusive box-A main frame absorbs shock loads, protects entire power train.

One-Piece Housing for steering clutches and final drives. It's strong, rigid, to resist twists and shocks . . . line-bored to maintain accurate gear and bearing alignment.

Rugged Final Drives — Small-diameter, double-reduction gears and short, thick shafts are tailor-made for today's bigger loads. Straddle mounting assures proper gear support, eliminates corner loading.

Tough Track — New heat-treating methods mean extra strength, hardness, wearability, long life even under severe conditions.

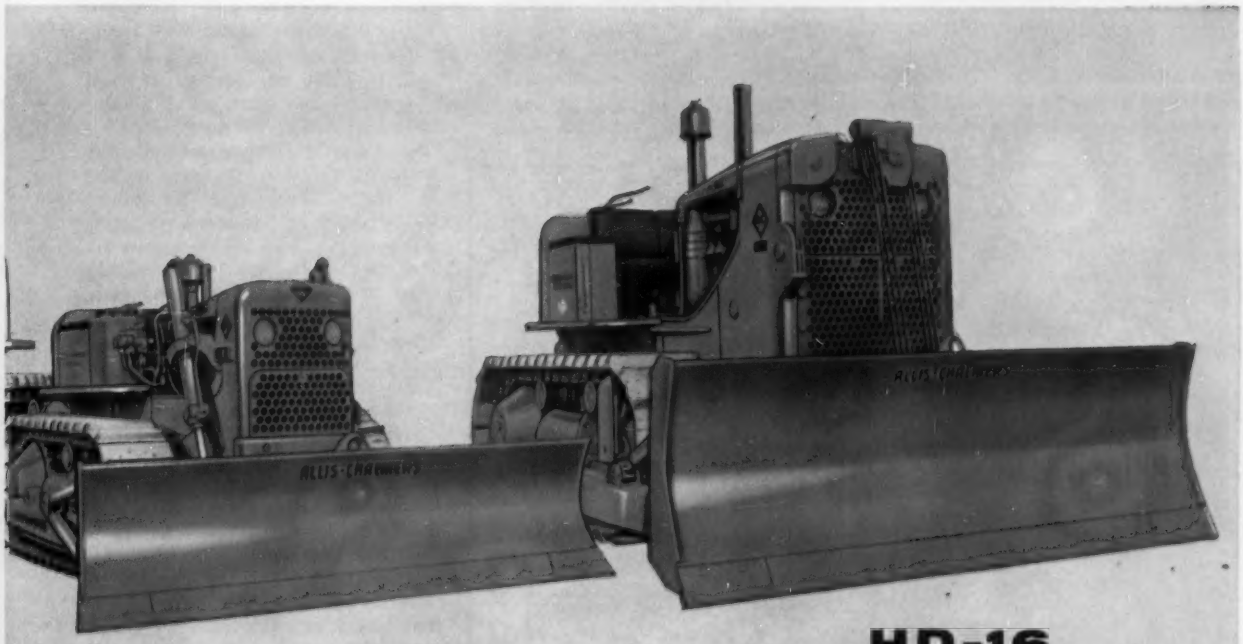
Saved Lubrication Time — On Allis-Chalmers tractors, you grease truck wheels, idlers and support rollers only once every 1,000 hours under any operating conditions—eliminate daily greasing — convert maintenance time into production time.

All-Weather Cooling Capacity — Big, well-protected radiators and cooling systems assure top efficiency and dependability in desert heat or arctic cold.

Wrap-Around Radiator Guard — Built-in dozer mounting reduces cost and weight, produces superior balance of tractor-dozer combination.

Longer-Wearing Master Clutches — Ceramic button lining (on all standard trans-

Crawler Tractors give you a - more working time – lower costs



HD-6
55 belt hp
approx. wt (as illustrated) 15,850 lb

HD-16
150 net engine hp (torque converter drive)
141 belt hp (standard transmission)
approx. wt (as illustrated) 38,200 lb

mission models) keeps clutches operating longer between adjustments, saves you time and money.

Smooth Torque Converter Drive — (standard on HD-21, optional on HD-16) — Automatically matches speed and power to load and terrain conditions, virtually eliminates shifting, assures steady, high output.

Matchless Servicing Accessibility — Unit construction permits easy servicing in the shop or on the job — quick removal of clutches, transmission, engine without disturbing adjacent assemblies.

Matched Equipment For Bigger Payloads — Fast-acting hydraulic or cable bulldozers, heavy-duty rippers, smooth-loading four-wheel scrapers make full use of Allis-Chalmers tractor advantages. You can also choose from a full line of tractor shovels from 1½- to 4-yd capacity.

The entire service program of Allis-Chalmers dealers is built around your needs. His factory-trained servicemen and all his facilities are designed to give you prompt and dependable service. What's more, he stocks only True Original Parts to assure you continued top performance and long equipment life. You owe it to yourself to see these new tractors at work. See your Allis-Chalmers construction machinery dealer soon.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

REAR HOOD of P&H crawler-mounted stabilizer mixes material with series of rotors. Metered amounts of liquid are added by spray bars. Adjustable tail gate spreads mix.

PAVING... Continued from page 176

watertightness, with a durable, resistant glazed surface after compacting. Coarse aggregates will be securely anchored against raveling, potholing, and dusting.

One method of salt stabilization is to scarify, shape, and moisten the subgrade, then run a mixer over it to blend the soil for a depth of 4 to 6 in. After moistening again, the salt is spread at the rate of 1 to 2 lb per sq yd. Next it is mixed full depth and compacted with a heavy pneumatic-tired roller.

On the moistened base, the wearing course material is spread and shaped. Subsequent procedure is the same as for the base, with salt quantity 1 to 1½ lb per sq yd. The surface is rolled immediately after mixing. As it becomes firm, enough water should be added to leave a free film on top. Rolling continues until the water disappears, leaving a glossy surface.

Somewhat similar procedures can be used for calcium chloride stabilization.

The most important point to remember about any type of mixed-in-place pavement construction is that the contractor who runs his job in the proper tight sequence will get the highest volume of finished work per day from his equipment. And profit comes from finished work.

Assume, for example, specifications call for an asphalt mix with oil content of 5½% at 240 deg application temperature and final compaction density of 95%. The contractor cannot shade these requirements. He must bring in the proper equipment and plan the job so that he can produce the required results.

What is the use of cheating on asphalt temperature if it will result in a balled up mix? Advance planning, good supervision, and cooperation with the engineer in testing—these are the things that make for profits.

The contractor who applies these basic rules can work easily and profitably with any type of binder. And he will produce mixed-in-place pavements capable of serving for many years either as secondary road pavements or as bases for high type highways.

EDITOR'S NOTE

This is the final article in CM&E's series on paving. A new series of articles on aggregate preparation will begin in our August issue.

FLEXIBLE FLIP-OVER WATER PROOF CONNECTOR CUTS DOWN TIME AND REPLACEMENT COST

Flip Seal . . . the electrical connector with the weatherproof seal . . . offers on-the-job protection never before possible. Here is the connector you can use with confidence in rain . . . where there is water lying on the ground . . . where dust, dirt, or metal particles are prevalent . . . where there is the possibility of crushing by machinery or trucks.

Heavy duty construction plus a locked seal which only extraordinary stress and strain will break are the features which keep Flip Seal on the job when ordinary connectors fail. The flexible lip overlapping the male cap of Flip Seal . . . as well as the seals at both cable entrances . . . stop moisture, dust, dirt, and metal particles from entering. Flip Seal's construction and the overlapping lip also give cushioned protection from crushing, shock, or abuse.

Cut down time and replacement costs due to faulty connectors . . . specify Flip Seal! Available in rubber and neoprene in a wide variety of blade arrangements. For additional details, see your electrical wholesaler or write: Rodale Manufacturing Company, Inc., Dept. CM6, Emmaus, Pennsylvania.

Rodale MANUFACTURING CO., INC. EMMAUS, PENNA.

Your old saw worth $22.50 trade-in!

on SKIL Super-Duty Models 77 and 825!

Brand-new features offer better performance, easier handling, longer service!

The response to our big saw trade-in offer has been terrific! If you haven't taken advantage of it, there's still time. But hurry! *Offer closes July 31.* You get the greatest super-duty saw value on the market . . . a $22.50 allowance for your old saw, regardless of make, age, or condition . . . when you buy Model 77 or 825!

SKIL Model 77 (7¼" Blade—Super-Duty)— Brand-new features mean smoother performance, easier handling, longer life. Speed increased to 4500 r.p.m. and weight cut to 15½ lbs. Power output boosted 100%. Depth of cut 2⅜"—bevel-cuts 2" dressed lumber at 45°. The standard for general construction.

Price, Model 77 (less case)	**$115.00**
Trade-in Credit	**22.50**
YOUR COST, ONLY	**$92.50**

SKIL Model 825 (8¼" Blade—Super-Duty)— Outstanding new features! Speed boosted to 4000 r.p.m. and weight reduced to 16½ lbs. Power increased 107%. Depth of cut 2⅝". Bevel-cuts 2" rough lumber at 45°. A powerful, super-duty saw, ideal for use on either residential or commercial construction. Powered to cut 2" rough lumber.

Price, Model 825 (less case)	**$135.00**
Trade-in Credit	**22.50**
YOUR COST, ONLY	**$112.50**

LOOK AT THESE BRAND-NEW SKIL FEATURES:

• **New Contour Handle!** Improved to assure most comfortable grip! Avoids strain—even through long, rough and steady use.

• **New, Improved Gearing!** Advanced design gives more gear contact for higher efficiency, longer service, quieter operation.

• **New Variable-torque Clutch!** For the first time, a clutch that really works! Eliminates kickback, protects against tool damage. Foolproof, completely dependable.

• **Heat-treated Aluminum Foot—40% Stronger!** Comparable to steel in yield strength, yet lightweight. Remains true and accurate under hardest use.

Plus all the other famous SKIL Worm-Drive features!

SKIL
PORTABLE TOOLS

Made only by SKIL Corporation
formerly SKILSAW, Inc.
5033 Elston Avenue, Chicago 30, Ill.
Factory Branches in ALL Leading Cities

——FREE! MAIL COUPON TODAY!——

SKIL Corporation, Dept. CME-66
5033 Elston Ave., Chicago 30, Ill.

I'm interested in $22.50 trade-in savings!
☐ Please advise name of nearest SKIL Distributor!
☐ Have a salesman call to make a demonstration!

Name_____

Company_____

Street_____

City_____ Zone____ State_____

The Unit You Will Use Every Hour of Every Day

There is more flexibility in a tractor with a back-hoe and loader than in any other equipment on the construction site today. You'll use it on more different applications than anything else you own. Trenching for footings, service lines, sewers and drains—digging holes for tanks and catch basins—loading aggregates and levelling and back filling and light stripping—carrying materials and supplies, cleaning up and distributing topsoil—and dozens of other jobs. It's an inexpensive machine you can easily afford to keep on the construction site, full time, for the many odd jobs that crop up so consistently.

The two big reasons why you see more Sherman Power Diggers than any other kind are simply these: You get more production from a Sherman and your Ford Tractor Dealer, having sold so many, is equipped and skilled in helping to keep your machine on the job working at peak output without costly downtime.

Now is the time to see your Ford Tractor Dealer for a demonstration of this dependable, high production back-hoe; or, write for Bulletin No. 843.

See the Sherman
Power Digger soon
at your local
FORD TRACTOR DEALER

Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN
POWER DIGGERS* • FRONT END LOADERS • FORK LIFTS

*Designed, Engineered and Manufactured jointly by Sherman Products, Inc., Royal Oak, Michigan. Wain-Roy Corporation, Hubbardston, Mass.

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Contractor-Labor Relations..

by LEON B. KROMER, Jr.

Check Before Hiring Summer Help

THAT BIG HALFBACK you hire for the summer may be a bruiser, but, in the eyes of the law, he's a child. The federal Wage-Hour Law (Fair Labor Standards Act) and state laws restrict the employment of minors.

Under the federal law, the basic minimum age is 16 years with some exemptions; newsboys, farm workers etc. This law restricts the hours of work to 40 in a week (when school is not in session) and prohibits employment of minors on certain types of work termed hazardous employment. Minors between 16 and 18 years cannot, for example, drive trucks or operate power equipment such as cranes, draglines, or bulldozers on construction projects.

The Wage-Hour Law applies to employees engaged in interstate commerce or in the production of goods for interstate commerce. If you are building a highway to bypass a city or an addition to an existing industrial plant (that is producing goods for shipment in interstate commerce) that "child" on summer vacation working for you is covered.

Check your state law on child labor. While requirements differ, these laws also restrict the hours and type of employment for children under 18. Federal and state laws require "age certificates" or "work permits" before minors can be employed. These are obtained, in the case of the Wage-Hour Law, from the U. S. Department of Labor, and, for state laws, usually the state Department of Labor.

If your project is covered by both your state law and the federal statute, the stricter of the two applies. There are a few state child labor laws not recognized by the U. S. Department of Labor as meeting the minimum requirements of the federal law. In these states the minor should obtain a U. S. Labor Department "age certificate." It's important to you to know whether or not your state law is recognized.

A safe rule to follow: Never employ a minor or anyone suspected of being a minor without obtaining the U. S. Department of Labor age certificate or, in recognized states, the state work permit or certificate.

Don't forget that minors also are subject to the minimum wage provisions of the Wage-Hour Law and state minimum wage laws. Under the federal act the minimum is $1.00 an hour. If your state requires a higher minimum wage, that rate applies. Since most state laws restrict the employment of minors to 40 hours a week, the overtime provisions do not come into the picture. Federal and state laws have teeth, and violations of the child labor provisions are serious—and costly.

A Fish Story

Because most Vermonters are trout fishermen, the opening day of the trout season (May 1) presents a major absenteeism problem to employers. This was solved by one manufacturing plant in Brattleboro by including the date as a paid holiday for its employees in the new agreement recently signed with the union. These employees may now fish on May 1 each year with a clear conscience—assuming that fishermen have a conscience.

Drive to Amend Federal Prevailing Wage Law

The Building and Construction Trades Department is spearheading amendments to the Davis-Bacon Act to extend its scope. The law now requires that, on federal public works projects, contractors pay at least the prevailing minimum wage rates to laborers and mechanics as predetermined by the Secretary of Labor. The law does not now apply to certain federally sponsored programs such as veterans housing, FHA housing, or highway construction.

As a first step, the Department has backed a provision in the Fallon Bill now before Congress that would require payment of so-called Davis-Bacon rates. This

use JOY SURGEPRUF

... THE NON-SKIVE COUPLING WITH THE DOUBLE-WEDGE GRIP

PERMITS THE USE OF MORE ABRASION-RESISTANT, RUBBER-COVERED HOSE

Insure longer wear in your hydraulic hose assemblies—and at the same time, save assembly time by avoiding old-fashioned skiving. Joy Surgepruf re-usable couplings make *both* advantages possible. Their exclusive "double-wedge" grip lets you use tough, abrasion-resistant, rubber-covered hose instead of the braided type—without any need for skiving the hose at the connection.

NO SPECIAL ASSEMBLY TOOLS REQUIRED

You need no mandrels or special tools to make up Surgepruf assemblies. No extra cost or special method is involved.

CAN BE RETIGHTENED WHEN LOOSE ON THE HOSE

Machine vibration or hose flexing can loosen any hydraulic coupling on the hose in time, but Surgepruf Couplings can be easily, quickly retightened on the job to stop a leak—*another* exclusive feature.

Surgepruf Hose Couplings are made to JIC Standards. Assemblies are available in many sizes and lengths, and in both single and double-wire reinforced types for medium-high and high pressure service respectively. *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*

Write for FREE Bulletin 10-22

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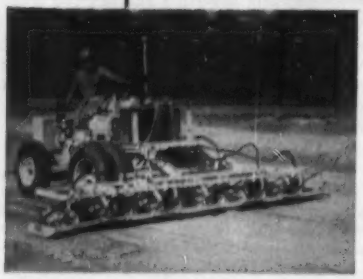
Here's **TREMENDOUS COMPACTION**

. . . for rapidly and most economically achieving or exceeding specified densities in the consolidation of rock, slag, gravel and sand base courses in waterbound and penetration macadam construction. The Jackson does it in just about half the time required with equipment of other types and is equally efficient in filling all the voids from top to bottom of rock and slag courses when sufficient fines have been spread.

Exceptional **ON-THE-JOB ADAPTABILITY!**



Above: a Jackson Multiple (6 units) on 7 mile sub-grade. Below: 2 units equipped with operating handle, self-propelling and easily operated by one man.

Standard width of the Jackson Multiple is 13', 3"; working speeds: up to 60' per minute; reverse: up to 5 MPH. Working width can readily be altered on the job to exactly suit narrower requirements such as widening projects. As many of the 6 compacting units as desired can be subtracted from the workhead, quickly and easily. Furthermore, easily interchangeable bases from 12" to 26" are available and individual compacting units may be fitted with operating handles and used exactly like the standard, highly popular, self-propelling manually guided Jackson Compactor. As a consequence Jackson equipment can be used on a great deal of work other machines cannot reach. If you have any job requiring compaction of granular soil, it will pay you to know specifically what Jackson Vibratory equipment will do. See your Jackson distributor. Literature and name of nearest Distributor on request.

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would mean that for all highway construction undertaken through this proposed federal-state program, the Secretary of Labor would set minimum rates to be paid laborers and mechanics at the site of work. If this goes through, the Building Trades Department hopes that amendments in 1957 will extend coverage to all programs financed in whole or in part by federal funds.

Some Results of Negotiations

More long-term, non-reopenable agreements are being negotiated this year than ever before in the construction industry. Reports from areas throughout the country indicate that the most common long-term agreements are for two years with wage adjustments spread through the period. The average increase in these agreements is 30¢ for the two years, usually 15¢ at the beginning of each year. Some agreements, to reduce the cost factor to contractors, provide for two adjustments the first year—7½¢ at the beginning, 7½¢ six months later, and 15¢ a year later.

The AGC heavy and highway chapter that negotiates state-wide agreements for New York (excluding the metropolitan New York City area) has recently concluded a three-year agreement with the operating engineers providing for a 45¢ adjustment through the three-year period. The heavy and highway contractors negotiated a four-year agreement with the laborers with a 32½¢ increase through the four years and adjustments for certain semi-skilled classifications.

New York State building contractors are negotiating two-year agreements averaging 15¢ each year. An exception is the recently signed five-year bricklayers agreement—which provides for a 10¢ wage increase each year and the establishment in the first year of a supplemental unemployment fund through a stamp plan. Contractors will purchase stamps from the depository and include an amount of stamps equivalent to 10¢ per hour in the bricklayers' envelopes each week. These are placed in a special book by each employee and may be redeemed at the depository during the months of December, January, and February only—the winter months of highest unemployment.

Goes places a standard station wagon can't... carries up to 50% more payload!

Take a good look at the new Dodge *Town Wagon*—the ideal low-cost vehicle for your business! It's a double-duty carrier of passengers, cargo, or *both*. And with Forward Look styling it's as handsome as it is versatile!

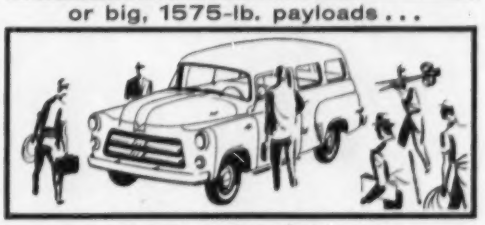
The *Town Wagon* is built on a rugged ½-ton Dodge *truck* chassis, giving you extra ground clearance for off-the-road driving. It's powered by either the famous Dodge L-head Six or the new Power-Dome V-8.

With seats in place, one model carries six passengers, the other eight. In the six-passenger model you've got about 90 cubic feet of load space in the rear compartment. The same amount of space is available in the eight-passenger model with the rear seat removed. You can also take all extra-passenger seats *out* of either model, leaving clear, unobstructed room for a big, truck-size payload of 1575 pounds.

You can see . . . and *drive* . . . the *Town Wagon* at your Dodge dealer's now.

Carry 6-8 passengers . . .

or big, 1575-lb. payloads . . .



or passengers plus cargo

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Please send me more information and complete specifications for the new Dodge *Town Wagon*.

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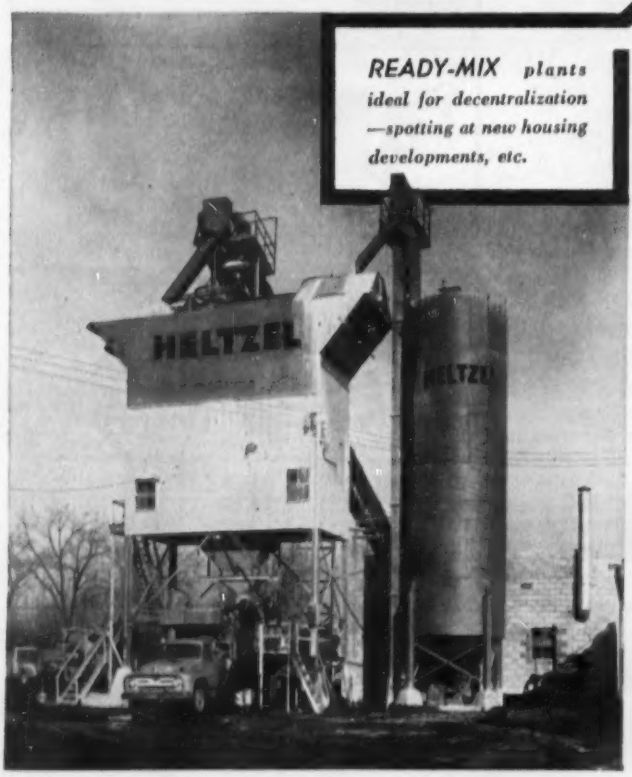
Every

JOB SITE *combination plants, designed to give you every batching advantage at the job location. They will cut truck time and wear enough to pay for themselves.*

READY-MIX *plants ideal for decentralization —spotting at new housing developments, etc.*



PIPE OR BLOCK *plants for job size concrete products manufacture; new business or auxiliary production.*

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Purpose

PAVING plants—
both aggregate and cement —that have proved themselves to be the finest yet engineered. True portability, plus unmatched speed and accuracy.

HELTZEL PORTABLE BATCHMASTERS ARE SETTING PRODUCTION, ECONOMY RECORDS WHEREVER CONCRETE IS BATCHED

● Heltzel designs and builds the most complete line of portable plants in the industry. There's a plant of every size for every type batching. From the small 30 ton Highway Plant to the big 200 ton Paving Plants—for straight cement, straight aggregate or combinations—every Heltzel Batchmaster Portable is designed to go up fast and dismantle easily, with a minimum crew. They are sectionalized to be carried over the roads on standard carry-all equipment.

Don't buy any plant until you have talked with the owner of one of these new Batchmasters, for true portability is but one of many new features that make the Heltzel 1956 Line the fastest, most accurate and flexible plants on the market. And remember Batchmasters cost no more—so why not operate with the finest.

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THE HELTZEL STEEL FORM AND IRON COMPANY
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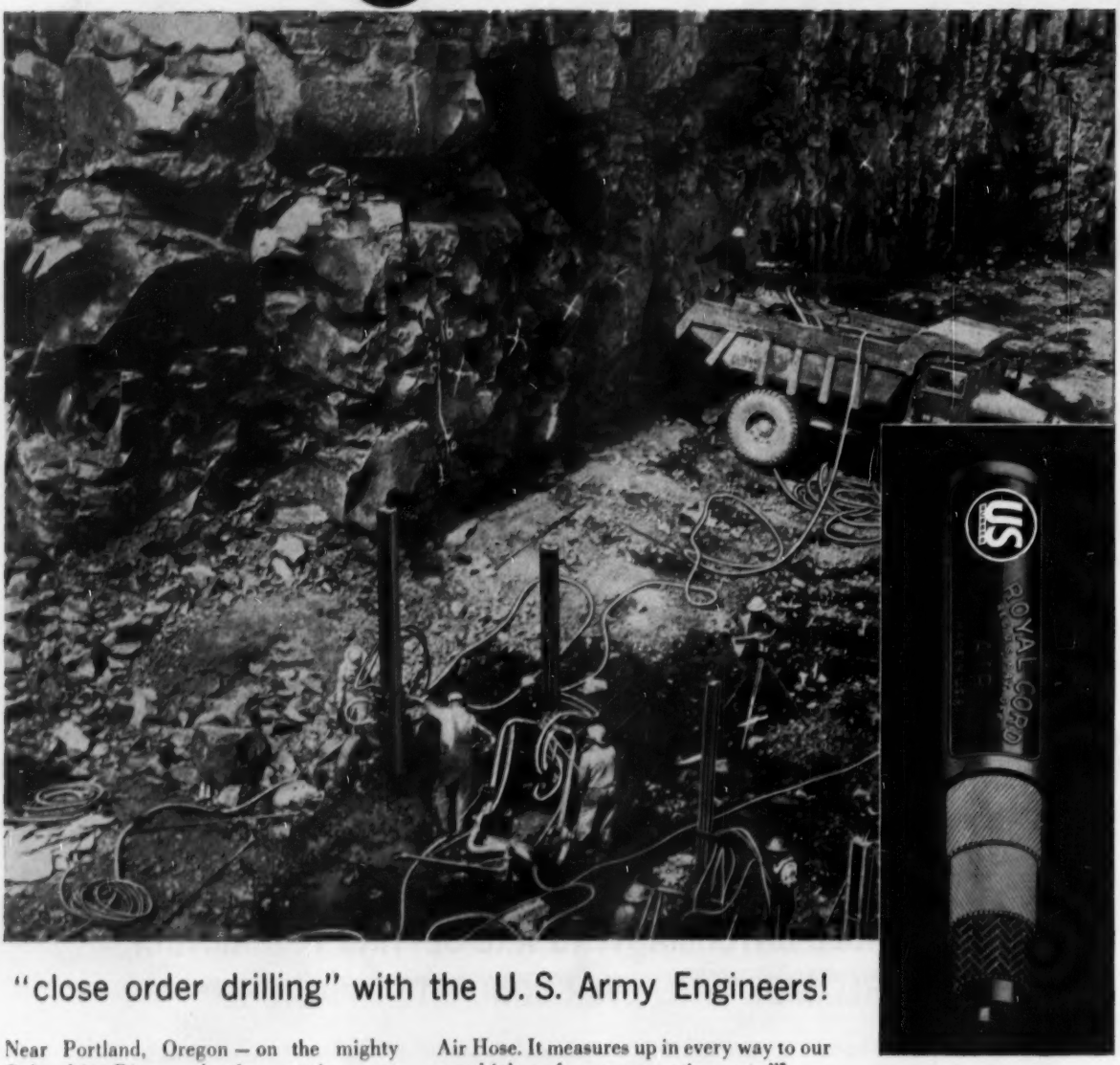
US RUBBER

Royal Cord Air Hose



"close order drilling" with the U. S. Army Engineers!

Near Portland, Oregon – on the mighty Columbia River – they're cutting out 1,000,000 cubic yards of tough basalt to construct The Dalles Dam. It's a $270,000,000 project. Much of the drilling is in deep, narrow cuts where highly abrasive rock and close quarters give air hose extra rough treatment. "Nothing is harder on air hose than the type of work involved on The Dalles Dam."*

What's more, deadlines and penalty clauses keep the work up to the tight schedule. So the contractors simply can't afford air hose failures. "We're using U. S. Royal Cord Air Hose. It measures up in every way to our own high-performance requirements."*

You, too, will find that U. S. Royal Cord will "measure up," because it's *the only air hose built like a tire.* True tire-cord construction means Royal Cord is so tough it needs no protective cribbing – yet it's lightweight and highly flexible.

Get Royal Cord Air Hose at any of the 28 "U. S." District Sales Offices or write us at Rockefeller Center, New York 20, N. Y.

*Direct on-the-job quotations from officials of the contractors building this multi-purpose dam.

Let's look under the cover

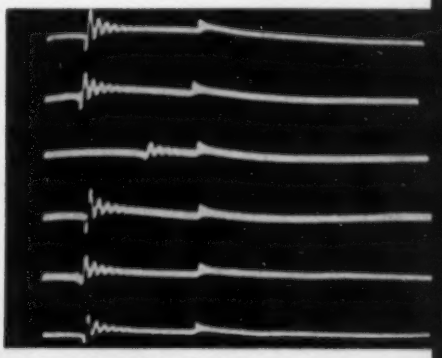
- quality neoprene tube for maximum hot oil resistance.
- braided cotton breaker ply for permanent tube-to-carcass adhesion.
- *exclusive counter-spiraled* plies of special yarn for outstanding strength and flexibility.
- brown cover is of the strongest natural rubber ever put on a molded hose.

US RUBBER

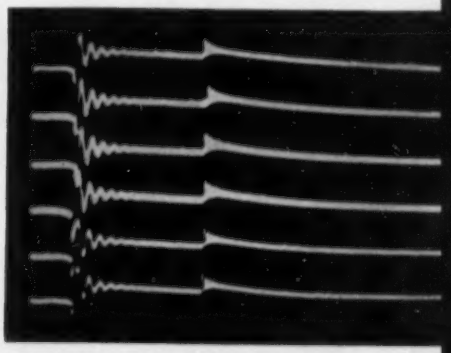
Mechanical Goods Division

United States Rubber

REVERSED COIL in ignition system, shown as inverted pattern on EnginScope's screen, was easily corrected by Vincent Walsh, Mahony-Troast Construction Co's master mechanic.



VARIATION IN PATTERN for No. 3 cylinder indicates shorted plug is wasting power.



IGNITION IS FINE if this pattern shows up on analyzer's easily-read, TV-type screen.

TV Screen Spots Engine Trouble

AN ELECTRONIC ANALYZER, with an easy-to-read TV-type screen that quickly spots engine trouble, removes a lot of the detective work that a mechanic usually faces when checking a gasoline internal combustion engine.

Called the TV-type EnginScope, the device will detect a wide variety of engine trouble, including fouled or misfiring plugs, worn distributor cam and shaft bearings, poor condensers, weak coils, sticking or burned valves, and defective wiring or switches.

Does it really work? CM&E arranged a demonstration of the device, developed by the Allen B. DuMont Laboratories, Inc., at the Clifton, N. J., yard of the Mahony-Troast Construction Co. Vincent Walsh, Mahony-Troast's master mechanic, asked that the device be used to test a dump truck that had been burning excessive gasoline, yet showing a loss of power.

Within a minute the device was hooked-up, and Walsh spotted the trouble—a coil in the ignition system had been reversed. Within five minutes the coil leads had been switched, the reversed polarity had been corrected, and the truck was on its way back to work.

The EnginScope, which weighs about 60 lb and is about the size of a small suitcase, operates from any 115-v, 50 to 1,000-cycle, ac power source, or from the battery of the vehicle being tested. By regulating a simple switch on the instrument panel, the device will test engines with from 4 to 18 cylinders. A direct reading tachometer on the instrument panel indicates rpm.

Test leads, supplied with the instrument, clip over the insulated distributor center lead and over the No. 1 cylinder ignition lead, regardless of the number of cylinders. The device is safe to operate because there is no need to disconnect or disturb ignition wires or to handle hot terminals.

As the points open for firing, a line appears on the TV-like screen for each of the vehicle's cylinders. If the engine has eight cylinders, for example, eight lines will appear, one below the other in firing order beginning with the No. 1 cylinder.

To assist in studies of dwell, mechanical tolerances, and cylin-

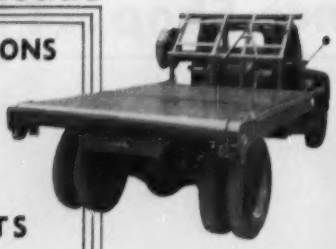
Get Heavy Duty Payloads

Regardless of JOB CONDITIONS with

"PACKAGED UNIT"

and other famous Leland bodies

SELF-LOADING FLOATS



With both the Single Axle Trailer and the Tandem Float, one man, unassisted, can load and move heavy machinery and equipment. Both are constructed for maximum safety and rugged dependability.

Plus — Single and Tandem Axle Pipe Trailers — Fifth Wheel Bodies.

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The real work-horse of construction equipment, Leland's "packaged unit" is world-famed for hauling, gin pole winching, towing, —any field job demanding the utmost in performance.

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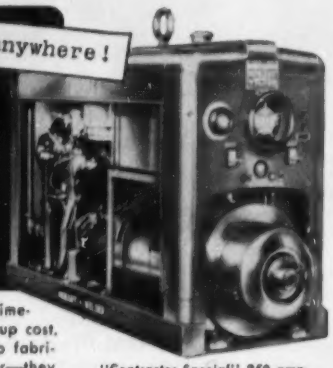
FAST-COMPLETE PARTS-SERVICE ON ALL TRUCK EQUIPMENT AND TULSA WINCHES

Cut Welding Costs with this Contractor Special welder

Welds anywhere!



"Contractor Special" 250-amp Gas Drive Arc Welder.

Do the job faster, better with Hobart. You'll avoid time-consuming breakdowns that delay the job and roll up cost.

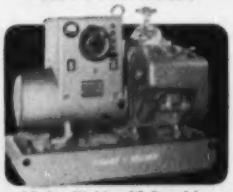
Hobart Gas Drive Welders are used anywhere to fabricate steel or repair equipment. No need for power—they provide their own. A type and size for every construction job—large or small.

Many contractors standardize on the 250 amp "Contractor Special." A full capacity 250-ampere welder, yet compact and lightweight for easy moving from job to job.

Others like the combination AC Arc Welder and AC Stand-by Power Unit. Welds or powers lights, tools.

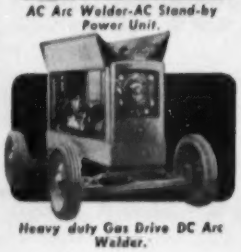
For extra heavy duty welding, contractors favor the Hobart DC Gas Drive Welders ranging up to 600-ampere capacity with many combinations of auxiliary power.

Check and return the coupon today for complete details!



AC Arc Welder-AC Stand-by Power Unit.

HOBART TROY OHIO WELDERS



Heavy duty Gas Drive DC Arc Welder.

Tear off and MAIL TODAY!

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☐ "Contractor Special" DC Gas Drive Welders ☐ AC Arc Welder-AC Power Unit ☐ Electrode samples for_____

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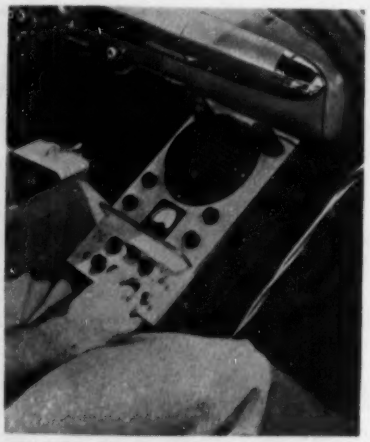
MAINTENANCE SHOP...

Continued



ROAD TESTS are possible because analyzer can be powered from the vehicle's battery.

der-to-cylinder timing, a scale can be clipped over the screen. The scale is calibrated in degrees of distributor rotation for 4, 6, and 8-cylinder engines.

As Walsh demonstrated, little training is required to interpret the readings on the screen. If the engine is working properly, the lines maintain a set pattern, but if something is wrong with the ignition system, it is easy to see the variations in the cylinder lines. Because one hook-up serves to test the entire system, there is no need to change the leads.

As an aid in teaching mechanics to interpret the light patterns that appear on the screen, DuMont has prepared a booklet of charts that shows the patterns that will be caused by various kinds of trouble. By checking with this booklet, even a beginner can spot trouble and diagnose it accurately.

It also is a simple matter to test a vehicle under actual road conditions because the EnginScope can be powered by the battery of the vehicle to be tested. The test leads are long enough so that the compact device will mount in the truck cab, ahead of the front seat. When it is hooked-up this way, the vehicle can be tested empty or loaded, when climbing steep hills, or when traveling at various speeds.

The electronic analyzer, which sells for about $725, was developed by DuMont in cooperation with the Socony Mobil Oil Co. and is now being manufactured in quantity by DuMont under a licensing agreement with the Socony organization.

"Sonny" Caravello (right), Greco Supervising Foreman, and Standard automotive lubrication specialist, Tom Farrell, go over Greco lube requirements. Tom Farrell has an engineering degree and has completed the Standard Oil Sales Engineering School. He has been providing lubrication technical service to Standard Oil customers for six years. Customers find Tom's experience and training pay off for them.

Greco Contractors, Inc. "moves the earth"

STANOLUBE S-1 Motor Oil helps keep Greco's equipment on the move

A lot of dirt in greater Chicago has been pushed around and hauled out of the way by Greco Contractors, Inc. One of the big projects on which Greco is now making the dirt fly is Chicago's Congress Street Superhighway. Greco dirt hauling trucks and dozers and shovels use STANOLUBE S-1 Motor Oil. There are good reasons why.

Moving dirt is a dirty job. Greco has neither time nor opportunity to baby equipment. Greco has a first rate maintenance system in operation and top servicing facilities but to meet schedules, dozers, shovels and trucks have to work hard and at top speed. This places a heavy burden on the motor oil. A motor oil that can't stand up to this kind of service breaks down. Heavy deposits build up on pistons and rings and the rings stick. STANOLUBE S-1 Motor Oil is specifically manufactured to eliminate the adverse deposits resulting from severe service conditions such as are imposed on Greco's equipment.

The job STANOLUBE S-1 is doing for Greco Contractors, Inc. by helping keep equipment moving earth, can also be done for you. Find out. Check with your Standard Oil automotive lubrication specialist in any of the 15 Midwest and Rocky Mountain states. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Jim Phelps, Standard Oil automotive lube specialist joins Tom Farrell in assisting Greco men with lube problems. Jim has 29 years experience with Standard—aviation as well as automotive. Here Jim discusses maintenance with Greco equipment foreman Tony Guerino.

Mack and White trucks, both gasoline and diesel, comprise the largest portion of Greco's dirt hauling fleet. Sonny Caravello (left) and Standard's Tom Farrell here talk over lube matters beside A-55 Mack Diesel.

Quick Facts About

STANOLUBE S-1 Motor Oil

1. Special heavy duty oil developed to meet unusually severe engine operating conditions.
2. Provides effective lubrication for automotive diesel engines even when using high sulfur fuels.
3. Manufactured from high quality "center cut" base stock.
4. Detergent-dispersant additives control deposits on pistons and rings.
5. Oxidation and bearing corrosion inhibitor additives prevent formation of excessive varnish and sludge; prevent corrosion of bearing metals.

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(Indiana)

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steel for the man in a hurry—our efficient warehouse methods permit fast delivery on a moment's notice from your J&L Warehouse

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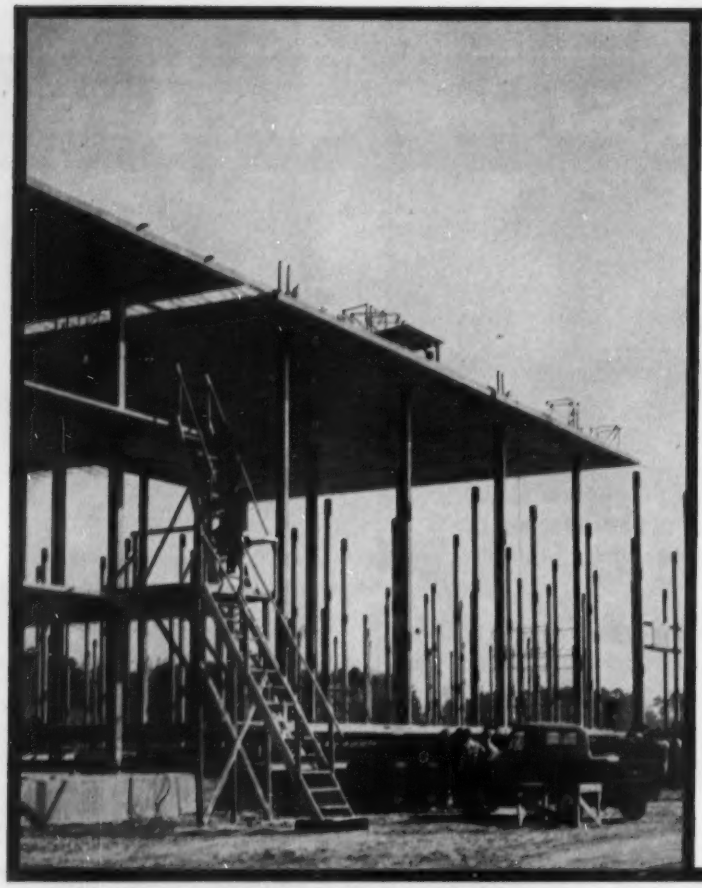

AN INDEMNITY BOND covered the contractor on this lift slab dormitory built for U. S. Navy at Little Creek, Va.

Extra Value makes the difference in Contract Bonds

INDEMNITY of North America is one of the leading independent markets for surety bonds. The extra value it gives is measured in . . . *Carrying capacity; Service* with agents and offices in principal cities of the free world; *Preferred rates* and *Prompt attention* for qualified contractors. For extra value in your bonding requirements see an INDEMNITY agent or your own broker.

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INDEMNITY INSURANCE COMPANY OF
NORTH AMERICA
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Construction Men in the News . . .

Corbetta Names Two Asst. V.P.'s

JOHN A. TANTILLO (left) and **JAMES B. LYTTLE** are new assistant vice presidents of Corbetta Construction Co., Inc., of New York. Tantillo and Lyttle formerly were construction superintendents.

Tantillo started in construction with Cauldwell-Wingate Company in 1937 and quickly worked his way up to job superintendent. During World War II he served as a captain in the U. S. Army's 80th Infantry Division. After the war he joined Corbetta as a superintendent on construction of American Airline hangars at Chicago airport. He now is directing the $11 million reconstruction of Drydock No. 3 in the New York Navy Yard, Brooklyn.

Lyttle is a professional engineer. His first job was field engineer for Rosoff Tunnel Corp. during construction of Wards Island intercepting sewer. He joined Corbetta in 1938 as a field engineer for all concrete work on the Bronx-Whitestone Bridge. He moved up to resident engineer, construction superintendent, and project manager for Corbetta. Lyttle currently is project manager for Corbetta-Yonkers Contracting Co. on the $16 million construction of the last three miles of the Thruway in Yonkers.

G. G. WERNER, Jr., is a new vice president of Merritt-Chapman & Scott Corp.'s Construction Department. Werner has served for more than 25 years as consulting engineer and manager of widely diversified projects throughout the world. He joined M-C&S after two years as project manager on the Moroccan Air Bases Project for Atlas Constructors.

Werner served in Venezuela as construction manager for U. S. Steel Corporation in development of the Cerro Bolivar Project for Orinoco Mining Company, and in Greece for Guy F. Atkinson Co. in the reconstruction of piers, roads, railroads, and airfields.

Prior to World War II service with the U. S. Navy Corps of Civil Engineers, Werner was a member of the consulting engineering firm of Malcolm Pirnie Engineers. A graduate of the Johns Hopkins University, he is a member of the American Society of Civil Engineers, American Water Works Association, New York State Sewage Works Association, The Moles, Society of American Military Engineers, and the American Arbitration Association.

COL. JOHN B. W. COREY Jr. will replace **Col. Philip F. Kromer Jr.,** (below) as district engineer for the Corps of Engineers at Chicago. Col. Kromer has been assigned to duty in Japan.

A reserve officer since 1934, Col. Corey was commissioned in the regular army and called to active duty in 1938. During World War II he served in Alaska and the Southwest Pacific. From 1952 to 1955 he was at Supreme Headquarters, Allied Powers, Europe, as executive officer in the office of the deputy chief of staff for logistics.

GEORGE I. SEYBOLD has been elected a vice president of Rust Engineering Co. Seybold was formerly vice president and assistant general manager of Chemical Construction Corp. of New York.

He has been in the engineering and construction field nearly 30 years. He previously was associated with Rust between 1948 and 1952 as project manager on several of the company's major construction contracts in the chemical and pulp and paper industries. His new responsibilities will include direct-

Now! Machines that 'Specialize' In Big Tract, Low Cost-per-Acre

LAND CLEARING

Tree Crusher. A 110-ton monster with steel-cleated rollers that crushes a broad swath of trees and undergrowth, compacting it for easy, in-place burning.

New Methods Quickly Clear All Types of Growth —Big Trees Pulled Out By Roots, or Cut Flush

Tree Saw for fast, flush-with-the-ground cutting. Revolving blade is electrically powered. Overhead boom directs tree's fall.

Tree Stinger pushes biggest trees out by the roots with its electrically powered, telescoping beom.

Powerful LeTourneau Land Clearing Equipment has been developed, tested and proved-by-use on all kinds of clearing jobs — including forest, brush, and lowland vegetation — where job specifications varied from flush-cut stumps to root systems completely removed.

Diesel-electric power drives every working part of these big special-purpose machines. Rubber-tired *Electric Wheels* drive and brake individually with powerful electric motors and gear reductions inside their rims — or big steel rollers revolve around clusters of motors and gears — to develop greater power and traction than ever before applied to land clearing.

These giant machines are surprisingly easy to operate and are so efficient that the initial investment is soon recovered by quicker clearing with much smaller crews.

Send for information and operating data on these machines for BIG land-clearing jobs

LETOURNEAU EQUIPMENT

R. G. LeTOURNEAU INC

Manufacturers of BIG Equipment Since 1929

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Yes — send me full information on LeTourneau land-clearing equipment.

Name_____ Title_____

Company_____

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City - State - Province - Country_____

Distributorships available in several countries. Write today!

C-114

CONSTRUCTION MEN...
Continued

ing the activities of the Rust engineering department. Seybold's headquarters will be in the company's home office in Pittsburgh.

HERBERT C. BALL is the new general superintendent for Ford J. Twaits Co., California contractors and engineers. Ball previously worked for the firm from 1934 to 1945 at which time he resigned to form his own company in Modesto. The new position was created, according to company officials, because of increased activity in the firm's business. In the past month, Twaits has been awarded contracts for construction of buildings for the National Broadcasting Company, Goodyear Tire & Rubber Co., the Ramo-Wooldridge Corp.

Three new buildings also will be built for Claremont College.

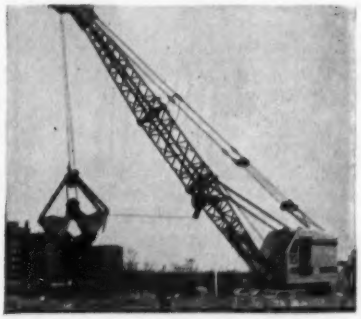
E. W. LITTLEFIELD, C. S. DAVIS AND FRANK M KELLER, three executives of Utah Construction Co, were promoted at a recent meeting of the firm's stockholders and directors.

Littlefield, who had served as general vice-president, was made executive vice-president. Davis and Keller, previously vice-presidents, were named general vice-presidents.

Formerly with Standard Oil Company of California, Littlefield joined Utah in 1951 as vice-president and treasurer. He was elected secretary in 1952 and a director in 1953. He will hold the posts of secretary, treasurer, and director in addition to his new position.

Davis previously has been concerned principally with heavy construction and Keller with light construction.

"Most dependable units we've ever used!"



Gar Wood 20-ton truck crane gives Frank L. Marino Corp. the right combination of heavy-duty performance and multi-job mobility. Like all "75's" it has heavy-duty, conical hook double rollers; power steering; direct manual controls; optional hydraulic coupling; easy convertibility for work with a complete line of attachments.

—says Frank Marino, Frank L. Marino Corp., Brooklyn, New York

Here's another leading contractor who depends on Gar Wood excavators to help keep jobs on schedule. A 75B with trench hoe and a 75BT truck crane with clam-shell are currently speeding work for this firm on the Linden Housing Project in Brooklyn. President Frank Marino says, "We've been using these units every day since we bought them, and they're certainly the sturdiest, most dependable units we've ever used. No down-time, repairs or service problems at all!"

Marino's operators like Gar Wood "75's" for still another reason. "Our operators say that the Gar Wood units are the easiest machines to operate they've ever worked with," reports Marino. "They especially like the clutch system." Gar Wood instant power actuated drum clutches increase production by reducing operator fatigue.

Gar Wood excavators deliver this kind of low-cost, dependable production because they're designed and built by specialists in ¾ yard machines. Find out for yourself how this specialization can pay off in more profit on your next job. Call your Gar Wood dealer, or write to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.

Gar Wood-Buckeye Hi-Way Wideners

Gar Wood Tractor Equipment

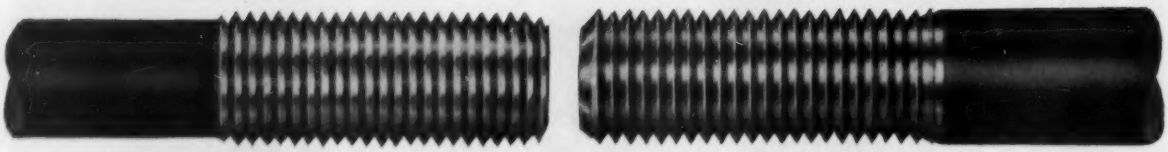
Gar Wood-Buckeye Ditchers

Gar Wood-Buckeye Finegraders

Gar Wood Winches

Gar Wood-St. Paul Hoists & Bodies

ROLLED or CUT THREADS?



Answers to questions we're often asked

Q. What is the important difference between cut and rolled threads?

A. A rod with a cut thread has an outside thread diameter which is the same as the body of the rod. Also, the end of the rod is usually pointed to remove the sharp starting thread.

Rolled threads have an outside diameter greater than the diameter of the portion of the rod next to the thread. And the end of the thread need not be pointed because a sharp starting thread is not present on a rolled thread.

Q. Which type of threads is better?

A. That's hard to say. But rolled threads are often the better choice. There are several reasons:

1. In many instances, rolled threads are cheaper. This is true because of the weight savings. You buy less steel. Also, rolled threads can often be produced faster. The savings to the customer on the larger sizes is often substantial.

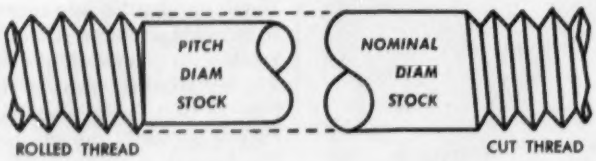
2. Rolled threads are likely to be smoother. And because cold-working hardens the threads, they are not as easily damaged. The cold-working also develops compressive stresses in the threads, making them more resistant to fatigue from repetitive streases in bending or tension.

3. Because the thread-rolling process "cold-works" the steel in the threads, rolled threads have a slightly higher tensile strength than cut threads. This advantage, however, diminishes as the diameter of the rod or bolt increases.

Q. How can I be sure that rolled threads are the best choice for a particular application?

A. To learn the answer to this question, all you need do is get in touch with the nearest Bethlehem sales office. We'll be pleased to have one of our engineers call at your convenience, to study your bolting problem, and offer recommendations.

Here are the facts. The table below compares various standard rod sizes and shows the weight savings possible when rolled threads are used instead of cut threads.



COARSE THREAD Size	ROLLED THREAD STOCK diam in.	ROLLED THREAD WEIGHT lb/ft	CUT THREAD STOCK diam in.	CUT THREAD WEIGHT lb/ft	WEIGHT SAVINGS pct	STRESS AREA sq in.	MINIMUM BREAKING LOAD* lb
¼-20	0.213	0.121	0.240	0.155	**21.8**	0.0318	2050
⅜-16	0.330	0.291	0.365	0.358	**18.7**	0.0775	5050
½-13	0.445	0.529	0.490	0.647	**18.2**	0.1419	9200
¾-10	0.676	1.222	0.740	1.475	**17.1**	0.334	21700
1 - 8	0.908	2.196	0.990	2.640	**16.8**	0.606	39400
1 ¼- 7	1.144	3.504	1.235	4.110	**14.8**	0.969	63000

*Minimum breaking load for cut threads is based on ASTM Spec. A-306, Grade 65, which has a minimum tensile of 65,000 psi. Breaking loads for rolled threads of same grade will be about 5 pct higher. For other grades of steel, breaking load of cut or rolled threads is in proportion to the tensile strength of the steel.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributors

Thew Shovel Co: The Hein Equipment Co., Milwaukee, Wis, is the newest Thew Shovel distributor. Hein will serve all of Wisconsin and counties in the upper peninsula of Michigan. C. H. Hein is owner of the new distributorship.

Koehring Co: The Cactus Equipment Co. of Houston will handle the complete line of Koehring heavy-duty construction equipment, along with products of three Koehring subsidiary manufacturers —Parsons Co., C. S. Johnson Co., and Kwik-Mix Co. Under the management of S. A. Witte, Cactus Equipment Co. succeeds F. S. Ray Co. as the Koehring representative in the area. The territory consists of the counties bounded on the North by and including Milam, Burleso, Burleson, Brazos, Madison, Walker, Trinity, Polk, Tyler, Jasper and Newton; on the West by Milam, Lee, Washington, Austin, Colorado, Wharton, and Matagorda.

Euclid Div.: J. W. Bloomquist, sales manager, has announced the appointment of Baton Rouge Equipment Co., Inc., as dealer for the complete line of Euclid earthmoving equipment in southern Louisiana. Baton Rouge Equipment Co. is a member of the Trippeer organization—a group of dealerships in Little Rock, Louisville, Memphis, Nashville, Knoxville and St. Louis. The territory was formerly covered by Euclid-Memphis Sales, Inc.

Napco Industries: The construction equipment div. of Napco has announced the following dealer appointments for front-end loaders: R. B. Wing & Son, Albany, N. Y.; Miller Equipment Co., Grand Rapids, Mich.; Miller Equipment Co. of Detroit, Livonia, Mich.; Powered Equipment Corp., Newton Highlands; Mass.; Knight Equipment Co., Richmond, Va.; Porter Supply Co., Huntington, W. Va.; In-

Only one man to move a

White TROWELER

Retractable wheel, up to trowel, down to move.

Remove blades and ring in *seconds* . . . for cleaning, changing blades, or moving through doorways.

Adjust blade pitch *during* rotation from handle. Safety throttle control stops rotation if operator lets go handle.

PORTABILITY, patented, exclusive! PERFORMANCE, unbeatable! PRICE, comparable to trowelers *without* these features! Model T-1, 36" diameter, Patent No. 2,621,568.

White MANUFACTURING COMPANY

ELKHART 6, INDIANA

backhoe on the go . . . in less than TWO minutes with MILLER *Tilt-Top!*

MILLER "B" 6 ton
$895.00* F.O.B. Milwaukee
Any optional equipment extra
*Plus Freight and 3% Federal Tax

Whatever you haul . . . dozers, rollers, trenchers, front-end loaders or backhoes, you'll load them faster . . . slash between-job-hauling time with a MILLER Tilt-Top! ONE man can tilt, simply drive the equipment onto the broad, oak decked platform, be on his way in *less than two* minutes! Available in a variety of single or tandem-axle models, there's a MILLER Tilt-Top to match your equipment needs. See these time saving, production boosters at your MILLER distributor today—you'll be surprised at how ruggedly they're built—how little they cost!

✓ built best
✓ priced best

See your MILLER distributor or write for FREE literature to:

Miller Tilt-Top Trailer Co.

457 S 92nd Street, Milwaukee 14, Wisc.

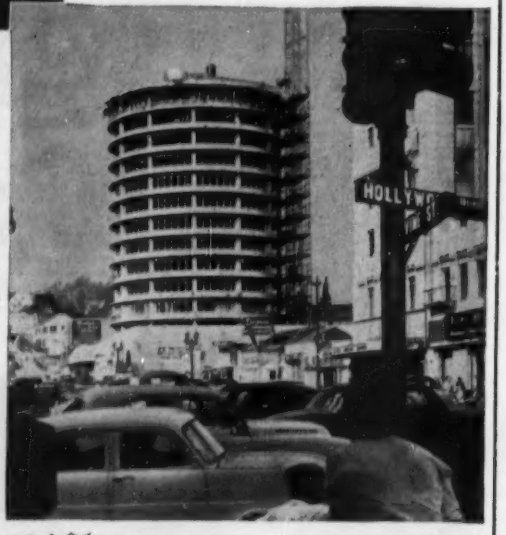
STRONGEST FASTENATION

at Hollywood and Vine...

A dozen floors above the street, in America's new Tower of Music, this workman anchors steel channel as easily as squeezing a trigger—driving fasteners straight, deep and powerfully into solid concrete with the RAMSET® DUO-JOBMASTER.

Complete flexibility with DUO-JOBMASTER

Both ¼" and ⅜" fasteners are set with the same tool, the new RAMSET DUO-JOBMASTER. It's the famous RAMSET tool with two interchangeable barrels—to handle *every* fastening job with any style or length fastener.



THE CAPITOL TOWER, spectacular new home of hi-fi Capitol records, dominates the heart of Hollywood, California.

First circular office building in the world, it was designed by architect Welton Becket; contractor is C. L. Peck. The $2 million structure is 13 stories high, acoustically engineered for minimum sound disturbance; has underground reverberation chambers with foot-thick concrete walls buried 25 feet into the earth.

NEED A KILN GUN?

Designed to dislodge clinker rings from rotary kilns, Western's Kiln Gun (now sold by Ramset) removes all types of stubborn, inaccessible obstacles. Write for complete details.

No matter what the construction problem, if it requires fastening to steel or concrete, RAMSET will do it better, faster, cheaper. Ask for new free catalog, just ready for you.

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SALES AND SERVICE...
Continued

dustrial Service Co, Inc., Norfolk, Va.; and Superior Equipment Co.; Phoenix, Ariz.

On the Sales Front

LeTourneau - Westinghouse Co.: Pat McNulty, who joined LeTourneau-Westinghouse in 1954, has been named district sales representative for eastern Tennessee, northern Alabama and all of Kentucky. He will work with the following LeTourneau-Westinghouse distributors: Dempster Brothers, Knoxville and Nashville, Tenn.; G. C. Phillips Tractor Co., Birmingham, Ala.; and Wilson Machinery and Supply Co., Lexington and Owensboro, Ky.

Euclid Div.: W. B. Dickerson has been appointed district sales representative for California and Nevada, except Elko and White Pine counties. His office will be at the Euclid regional office in Oakland, Calif. Dickerson was formerly district sales representative in the Seattle, Wash., area.

Jay Corp.: Appointment of Donald Masson as sales manager was announced recently. Masson comes to Jay from Lincoln Plastics where he was general manager for two years. Previous to that he was in business for himself as a management consultant for six years. He is a member of the American Society of Professional Engineers.

Blaw-Knox Co.: Richard S. Connolly, formerly a sales engineer with the heavy steel forms department, has been named assistant sales manager of that department. A graduate of Carnegie Institute of Technology, Connolly is a registered professional engineer. He joined Blaw-Knox in 1947.

In the Main Office

Borg-Warner Corp.: Robert S. Ingersoll was elected president of Borg-Warner recently in a major reorganization of the corporation's top management. He previously was an administrative vice president. Roy C. Ingersoll, formerly chairman of the board and president, was re-elected as board chairman and was named chief executive officer, but relinquished the presidency after six years in office. Other management changes include an executive vice presidency for Lester G. Porter, the election of Albter Steg as financial

Big Michigan Tractor Shovel loads out 4,400,000 lbs. of open hearth slag per day

Clearing ground for the Lake Calumet Harbor near Chicago, Contractor C. J. Wilson is removing 700,000 yds. of open hearth slag dumped by neighboring steel mills. This material weighs approximately 4000 lbs. per yd., is extremely abrasive and tough to dig. With one 2¼-yd. Michigan Tractor Shovel, Wilson is loading out 110 trucks per day—10 yd. six-wheelers. That's 4,400,000 lbs. of slag per day!

Does work of 1½-yd. shovel

Wilson says that he couldn't beat this production with a 1½-yd. shovel. Calculating the hourly cost (initial cost, depreciation, maintenance, etc.), of a dragline versus the Michigan, the Michigan does the job at least 40% cheaper. With the abrasive ground conditions which prevail on the job, Wilson is naturally enthusiastic about being able to do the job on rubber-tires.

"Can't beat the front-end"

Since the first Michigan Tractor Shovel was introduced early in 1954, more and more contractors have found that this machine will handle jobs which they'd never even attempted with rubber tired equipment. Veteran crawler-loader owners, like C. J. Wilson agree that you can't beat the front-end on this machine. It will out-dig any make or type of Tractor Shovel, bar none.

Balanced power and weight

The best way to understand the Michigan's operational advantages is to watch one *ease up to a pile of tough material and come out with a heaping bucket load.* You don't have to ram the pile to get penetration. The Michigan's combination of bucket action, weight and power enables the machine to *dig its way* into the pile. 133 diesel horsepower flows smoothly through the 3-to-1 torque converter, 4-speed power-shift transmission and heavy duty drive axles right out to four big tires. Planetary gears in the wheel hub eliminate axle breakage . . . they take 70% of the torque load off the shafts.

Clean design of the Michigan bucket mechanism provides good dumping clearance. Note the heaping bucket load: 40-degree low-level tip-back guarantees heaping loads of any material which can be heaped.

Standard on all models

Clark torque converter, power-shift transmission and planetary wheel drive axles are standard equipment on every model in the Michigan Tractor Shovel line—1-yd., 1⅜-yd. and 2¼-yd. capacity. In each capacity, a Michigan Tractor Shovel will give you more useable digging power and traction than you've ever seen on this type of machine—faster production, lower cost per yard. For proof, ask your Michigan distributor to demonstrate—*you name the job.*

Michigan is a registered trade mark of

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 14, Michigan

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WEIGHT
HIGH
STRENGTH
VERSATILITY
ECONOMY

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offer you these advantages for Fast, Low-Cost, Lasting Construction

Prefabricated by electronic controlled welding equipment, these strong lightweight steel joists are easy to handle and place, and are adaptable to a wide range of construction requirements.

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General Contractor:
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SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

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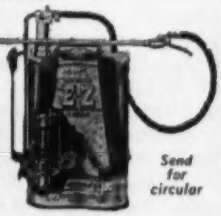
DRINKING WATER & SUPPLY TANK NO. 75G

Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular.

E-Z
5 gal. Knapsack Sprayer

For spraying oil on machinery and equipment to prevent rust, etc. 4 to 5 gal. capacity. Also for spraying silicon water repellents for masonary work and many other spraying purposes.



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"Choice for Quality the World Over"
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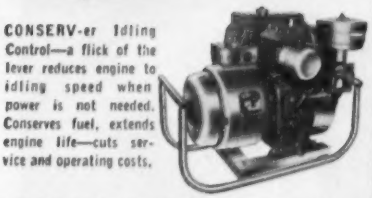
ONLY WINCO®
Portable Electric Power
Gives You the Exclusive New
CONSERV-er
IDLING CONTROL
✓ Extends Engine Life
✓ Reduces Fuel Consumption
✓ Lowers Maintenance Cost



CONSERV-er Idling Control—a flick of the lever reduces engine to idling speed when power is not needed. Conserves fuel, extends engine life—cuts service and operating costs.

205B14S2D-1M2—New 2500 watt Direct Drive contractor model. 115 volts, 60 cycles, A.C. Carrying cradle optional—Specify Kit #23410. Speedy-Shift dolly available as optional equipment—Specify Kit #2305.

Please send me full information about Winco Portable Electric Power with exclusive new CONSERV-er.

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SIOUX CITY, IOWA

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Address.....
City.....State.....

WINCHARGER CORPORATION
SIOUX CITY, IOWA
Subsidiary of Zenith Radio Corporation

SALES AND SERVICE...

Continued from page 200

vice president and treasurer, and the appointment of Robert W. Murphy as vice chairman of the executive committee.

International Harvester Co.: John L. McCaffrey, president of I-H since 1946, has been elected chairman of the board of directors and chief executive office of the company. At the same time, Peter V. Mulder, formerly executive vice president, was elected president of the company to succeed McCaffrey. Frank W. Jenks, formerly vice president in charge of merchandising services, was elected executive vice president and Harry O. Bercher, formerly vice president in charge of the steel division and purchasing and traffic, was also elected an executive vice president.

Special Mention

Hyster Co.: A $150,000 factory addition in Peoria, Ill, will be erected as part of Hyster's expansion program, according to Eugene Caldwell, vice president and general manager The new addition will add approximtely 25,000 sq ft of floor space to present Peoria plant facilities. Construction will start this month and completion is scheduled for November of this year.

Buda Div., Allis-Chalmers Mfg. Co.: A new distribution policy for Buda material handling equipment has been announced by Allis-Chalmers. For the first time, dealers of Buda equipment will work through 12 factory branches and a Chicago district office. The branches will supervise sales and service and will carry a stock of parts, as well as new machines and accessories. The new policy is designed to provide closer contact for dealers and customers with the company.

Associations

Asphalt Institute: In a move designed to end rumors of an impending asphalt shortage, the Asphalt Institute has assured state highway departments that ample stocks of asphalt will be available for all highway needs. "A poll of asphalt producers . . . established the fact that refineries are prepared to meet any demands for asphalt this year," according to J. E. Buchanan, Institute president. The Asphalt Institute represents 52 asphalt producers and asphalt-producing petroleum companies.

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to find better
PROTECTIVE CLOTHING!

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FROG BRAND®

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For every industry where personnel protection and safety are vital, only Sawyer Neoprene Latex Clothing offers all these advantages:

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- "Exclusive Coating Process" . . . (for years and years of extra wear and durability) — *original* with Sawyer!
- guaranteed not to peel, blister or crack in ordinary usage!
- double interlocked sewn seams that can't come apart!
- solid brass or non-conductive fastenings that can't rip off or corrode!
- designed for roomy, action-free comfort!

Sawyer clothing also Rubberized or Oiled. Full range of jackets, pants, coats, hats, aprons for more efficiency, more economy, more protection on every job!

Make us prove it!

Send for complete details and price list.
The H. M. Sawyer & Son Company
A Division of Sawyer-Tower, Inc.
specialists in Protective Clothing for more than a century
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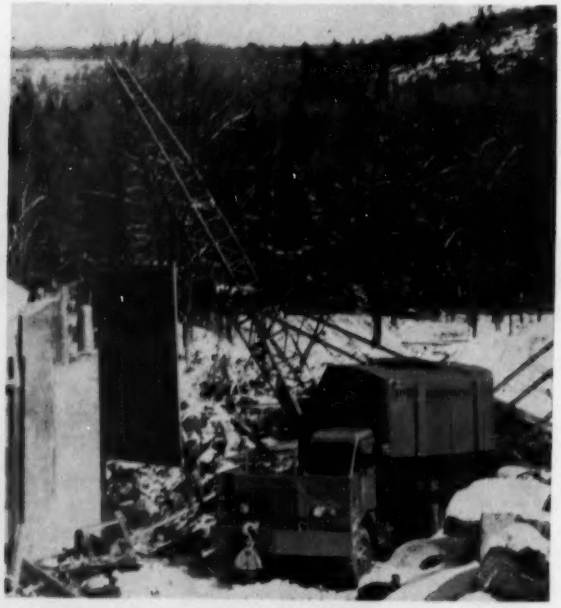
Construction Equipment News . . .

Easy to Roll Back For Second Pass

Stow's new concrete vibrating screed has a rear-end roller assembly that supports the screed off the concrete when the operator lifts up on the handle. This feature makes it easy to roll the screed back for a second pass. Especially adaptable to bridge deck construction, the design incorporates underslung beams so that the end roller rides on I beam rails mounted above the screeded surface. A 2½-hp engine, mounted on rubber in the center of the beam, powers the vibrating unit. Vibration speed is controlled by throttle from the end of the beam. The throttle control has a locking device so that it will not move in spite of the vibration of the screed. Handle assemblies are protected from vibration by rubber mounts.—**Stow Mfg. Co., 443 State St., Binghamton, N. Y.**

Traxcavator Now More Versatile

Angling-blade bulldozers, designed for Caterpillar Nos. 977, 955, and 933 Traxcavators, will convert the versatile loaders into handy tools for backfilling trenches or replacing earth around new foundations. Easily mounted or dismounted, the bulldozer C-frames are connected to the Traxcavator lift arms. Buckets and blades use the same controls and cylinders.—**Caterpillar Tractor Co., Peoria, Ill.**



Truck Crane Version of 305

The truck crane version of the recently improved Koehring 305 excavator has a lift capacity of 25 tons and a rated road travel speed of 30.2 mph. The wheelbase is 205 in., with 9-ft axles and front and rear outriggers boosting lift capacity over the sides and rear. A standard 30-ft main boom can be extended to a maximum 100 ft. length, and a 30-ft jib boom can be added.—**Koehring Co., Milwaukee, Wis.**

International Offers Off-Highway Trucks

International Harvester has entered the off-highway truck market with two rear-dumps—the 16-yd model 95 and the 12-yd 65. Both trucks, called Payhaulers, feature high travel speeds and good power-to-weight ratios. The 24-ton model 95, powered by a 335-hp Cummins turbo-charged diesel, has a top traveling speed of 38 mph with torque converter and power shift transmission. It has a 13¾-ft wheelbase, and a 30 ft 5-in. turning radius. The model 65 Payhauler, with a 13 1/6-ft wheelbase and a 29¼-ft turning radius, is powered by a 250-hp Cummins turbo-charged diesel. Hydraulic double-action hoists on both trucks raise chute-type bodies to a dumping angle of 65 deg.—**International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**

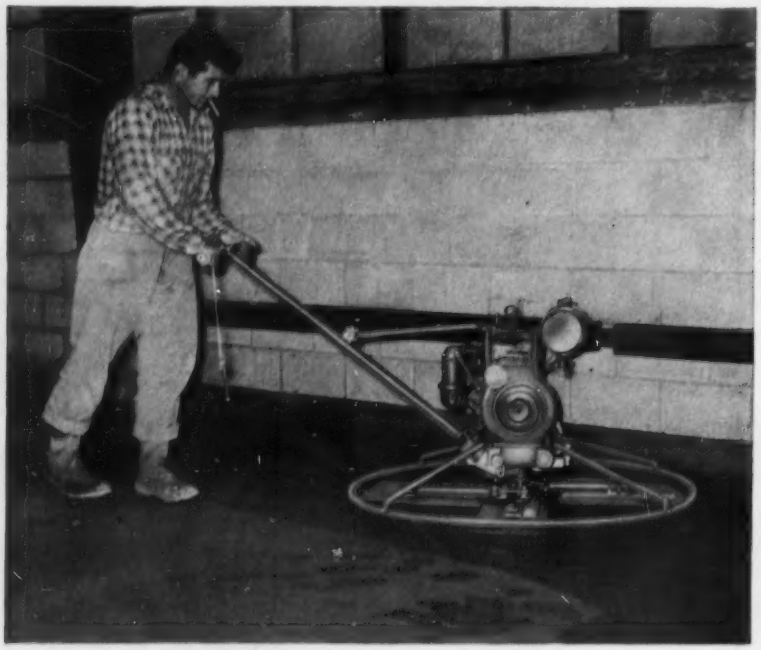
Rear-Engined, Crawler-Mounted Tractor Shovel

After testing it for several years, International Harvester has unveiled a 1¾-yd, rear-engined, crawler-mounted tractor shovel. Power plant for the new model 12 Payloader is a four-cylinder, four-cycle valve-in-head-type International UD-350 diesel with a peak hp rating of 91.5 at 2,000-rpm. Net rating is 77 hp at the flywheel. With the engine mounted in the rear, the power plant not only drives the unit but also serves as a counterweight, eliminating the need for hauling around a quantity of superfluous steel. Selling for $16,500, fob factory, the new Payloader has power-booster controls, steering clutches and steering brakes. Immediately behind the rear-mounted engine is a 2:1 multiplication, single stage torque converter. It is housed in an accessory drive

(Continued on next page)

Concrete Finishing News

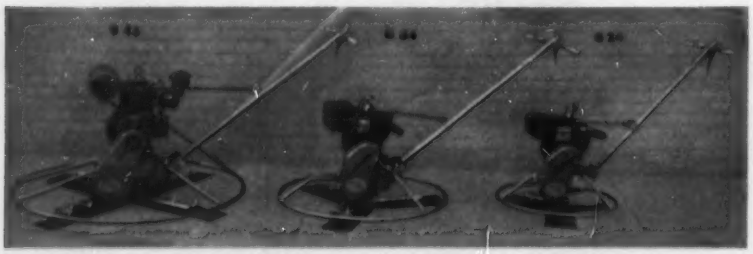
by STOW Mfg. Co.



On big concrete finishing jobs, it is important to know that the STOW G-46 Roto-Trowel will finish 5 more square feet per revolution than the G-34. This means that the G-46 can get the job done twice as fast. Notice that the G-46 Roto-trowel has 4 blades for extra-smooth trowelling. It has many important safety features, among which is the fool-proof, dead-man clutch control on the handle that stops the blades from rotating the instant the operator releases pressure on the handle; a rugged, non-rotating guard ring lets you work up to and around walls and other obstructions.

When you strike off concrete, you can save money by using the STOW Vibrating Screed. You can use a denser, drier concrete, which means that trowelling can be started sooner.

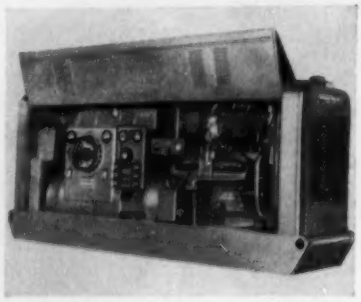
For more information on STOWS trowels and screeds, write today!



STOW MANUFACTURING CO.

31 Shear Street Binghamton, N. Y.

case along with the main hydraulic pump, transmission oil pressure regulating valve, and the oil filter case for transmission and torque converter. The unit's transmission is a full-reversing, power-shifted, constant mesh gear box capable of providing three forward speeds ranging from 0 to 10.1 and three reverse speeds from 0 to 13.1 mph. The standard 1¾-yd bucket has a digging force of 17,500 lb, and bucket tip-back of 40 deg. at ground level. The loaded bucket raises to a maximum 8 5/6 ft in about 11 sec, and lowers to ground level in less than 9 sec. The Payloader is mounted on the TD-9 tractor assembly with extended track frames equipped with 15 in. wide, low profile grouser shoes. Gage from center to center of the tracks is 60 in. and the total area of ground contact is 2,246 sq in. Ground clearance is 11 1/3 ft. The hydraulic system is pump driven through an accessory drive, and the boom is raised or lowered by two 7-in. dia double-acting cylinders. Two 4-in. dia double-acting cylinders operate the bucket. All four piston rods are chrome-plated.— **International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**



WELDER PLUS—A new gasoline engine driven dc arc welder with a choice of auxiliary ac power has been developed by Hobart Brothers Co. The welder is available in a 300 and 400 amp size with a choice of 6 or 12 kw auxiliary ac power. Full capacity provides 110 or 220-v power service. The welding control panel is equipped with a current range hand wheel, volt-amp adjuster, and welding cable connecting studs. Welder ammeter and voltmeter are available as optional equipment. The auxiliary power control panel has a voltmeter frequency meter, field rheostat, de-energizing switch and the following studs and receptacles: 3 kw, 100/200 v, 3 wire, 60 cycle out-

Low-cost general construction hauling of stone, earth or asphalt is provided by the Mack B42S powered by the Mack Magnadyne engine.

"equal to any task"

Says Mr. Charles H. Ready, president of Ready Paving & Construction Co., Chicago, about his Macks . . . and with plenty of experience to back it up.

Back in 1920, the Ready management bought its first Mack to replace horse-drawn wagons. This chain-driven unit was retired only two years ago, after rolling up more than a million miles of heavy-duty construction hauling.

Today, the Ready fleet contains 18 Macks, including seven new B42S dumpers. These six-wheelers regularly haul 15 tons of stone or asphalt, or 15 yards of earth, both on- and off-highway. Their Balanced Bogies with exclusive Mack Power Dividers enable them to work in mud and on rough terrain where other makes can't operate. Famous Mack Magnadyne engines furnish plenty of power to keep these heavy haulers on the move with the barest minimum of time-out for maintenance and overhaul.

Here's how Mr. Ready sums up their 36 years' experience: "Our Macks have been found to be rugged and economical, always dependable, and equal to any task."

That verdict on Macks is practically unanimous throughout the entire construction industry. Whatever you want to haul, wherever you want to haul it, Macks are built to get the job done on schedule, at the lowest cost per mile. Mack Trucks, Empire State Building, New York 1, N. Y. In Canada: Mack Trucks of Canada, Ltd.

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TRUCKS

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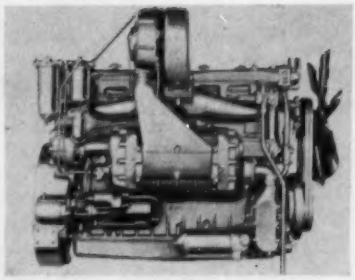
(Advertisement)

lets to operate small motors and tools; 6 kw, 220v, 3 phase, 60 cycle outlet studs to operate motors up to 7½ hp; six 1 kw, 110v, 60 cycle outlet receptacles, each to operate lights or small tools, and three 2 kw, 220v, 60 cycle outlet receptacles.—**Hobart Brothers Co., Hobart Square, Troy, Ohio.**

TURBOCHARGED ENGINES — GMC's Detroit Diesel Engine Div. has added three Turbopower engines to its series 71 line of two-cycle diesels. They are four and six-cylinder fan-to-flywheel models and a six-cylinder base-mounted power take-off unit. Principle feature of the new diesels is a single-shaft exhaust-driven turbine and air impeller that increases power and gives greater fuel economies. The four-cylinder engine has a 171-hp rating at 2300 and the six cylinder engine is rated at 236 at 2,100. Because of their compact size in relation to horsepower, these units are suited for use as replacement power in on-or-off-the-highway trucks. Both fan-to-flywheel engines



weigh approximately 9½ lb per horsepower. Changes have been made in the cylinders to take care of the increased air supply and the corresponding increase in exhaust gases. Larger air-intake ports and four exhaust valves in each cylinder permit this increased charge of air to enter the cylinders.—**Detroit Diesel Div., General Motors Corp., Detroit 28, Mich.**

NEW *Batch Type* Asphalt Mixing Plant

(Capacity 100-180 TPH)

Portable Dryer Unit

Gradation Unit, showing operator's platform.

This completely portable new batch type plant is built in two sizes—M-40 (100 to 120 TPH) and M-60 (150 to 180 TPH).

All units are wheel mounted, and no crane is needed for erection. Plant can be moved from one job to another and set up in a minimum of time. All piping and wiring are permanently installed—with quick disconnects.

The design and engineering of this plant provide a flexible setup arrangement. All remotely located units are driven with electric motors. No shafts, universal joints, chairs, gears, etc. Meets all State specifications.

The complete plant—tanks, oil heater, power units, piping, etc., are available from one source. For complete information see your nearest H & B distributor or write direct.

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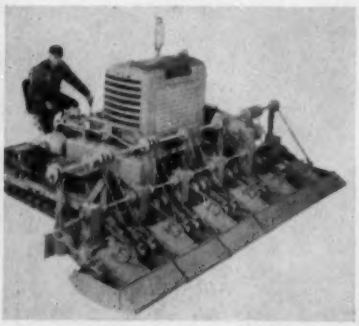


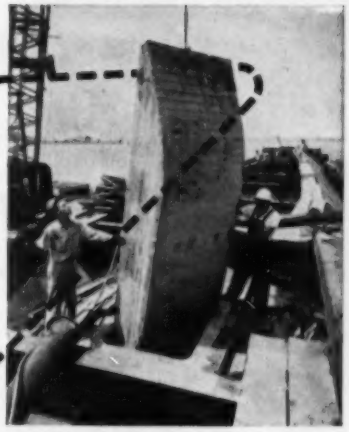
BETTER VIBRO-TAMPER — A 17.5% increase in the weight of eccentric rotors in the redesigned compaction shoes of the VT 6-4 Vibro-Tamper is reported to increase single-lift compaction of sub-base and base courses by 8%. To power this increased weight, the machine has been equipped with a new 75-hp engine. The Vibro-Tamper has six shoes equipped with eccentric rotors in opposition, but driven from a common floating power shaft. With the added rotor weight, each shoe now provides a force of over 8,640 lb at 2.200 vpm. According to the manufacturer, the new 80-lb rotors enable the machine to compact single lift of sand, gravel and other materials 12 in. deep in only two passes at a rate of 20 to 38 fpm. Width of compaction is adjustable from 13 1/6 ft maximum to 8½ ft by removing the two outside shoes. Power to lift the shoes is provided by a hydraulic system employing a 17-hp hydraulic motor. Two levers provide full control of the machine.—**International Vibration Co., 16702 Waterloo Road, Cleveland 10, Ohio.**

(Continued on page 211)

Like passing a camel through a needle's eye!

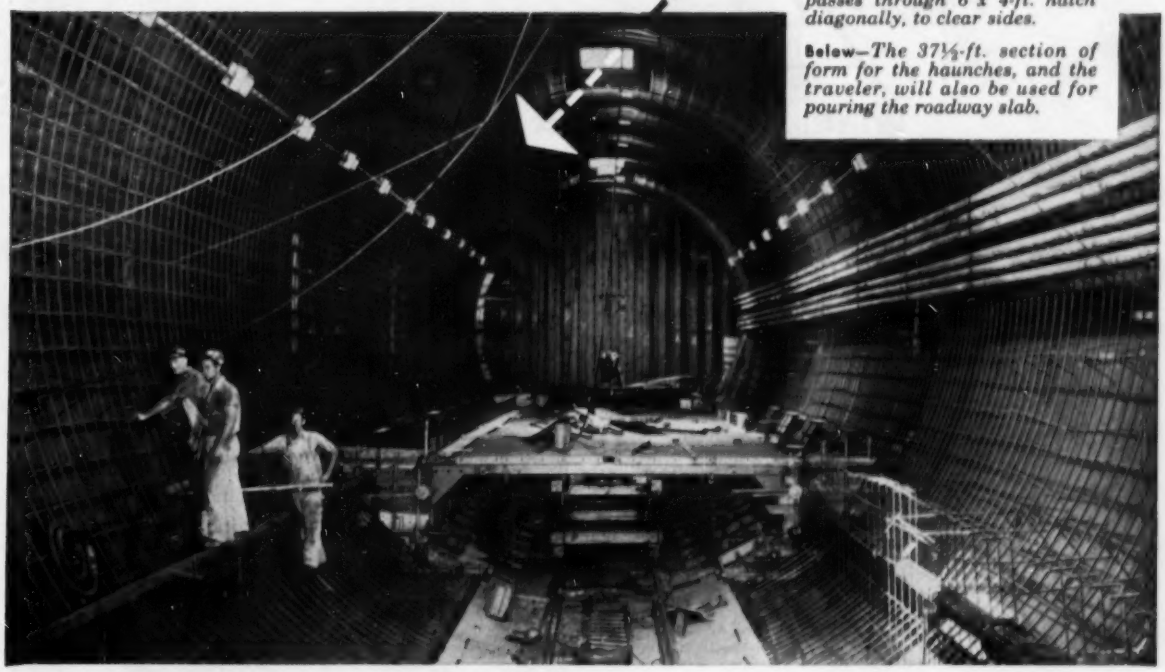
BLAW-KNOX STEEL FORMS

for a 300-ft. long by 30-ft. diameter tunnel tube section pass through a 6-ft. by 4-ft. hole!



Above—*Blaw-Knox sidewall form passes through 6 x 4-ft. hatch diagonally, to clear sides.*

Below—*The 37½-ft. section of form for the haunches, and the traveler, will also be used for pouring the roadway slab.*



● It sounds impossible, but Blaw-Knox engineers did it! For the Hampton Roads Tunnel, a job involving 5 pour lifts on the river surface, then sinking 23 tube sections into a prepared trench, a unique Blaw-Knox form design permits passing two complete 150-ft. sets of forms through a 6 x 4-ft. hatch opening.

Three other major problems were solved by Blaw-Knox simplified forming methods. During the placing while the tube shell floats on the surface, flotational stability is maintained to prevent capsizing. The job moves like clockwork, with no unnecessary delays for setting or stripping forms or waiting for pours to cure. A better bond for tiling the tube sidewalls is obtained by welding scoring wires to the forms.

These time and money-saving steps are expected to knock several months off scheduled time.

Write for a free copy of the reprint entitled "Linked Car Floats Quickly Sink Tunnel Tubes" giving a vivid story of the Hampton Tunnels job.

WHEN YOU HAVE A DIFFICULT CONCRETING PROBLEM, take advantage of the Blaw-Knox Steel Forms Consultation Service in the preliminary planning stage. Blaw-Knox engineers have solved similar problems and saved money for other contractors. There's no substitute for Blaw-Knox years of practical experience. Call, wire or write Blaw-Knox today.

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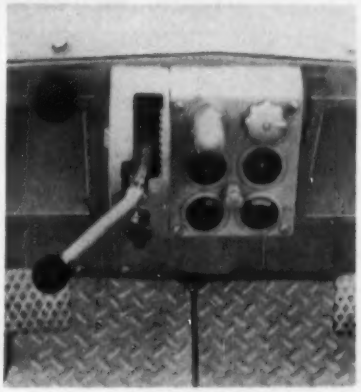
IMPROVED INTERNATIONALS—Increased horsepower ratings, better operator visibility, Cerametallic clutch facings, 500-hr track roller seals, and easy-starting conversion systems are among features of the redesigned International TD-18, TD-14, TD-9 and TD-6 crawler tractors. All the redesigned models have been equipped with International's new Cerametallic clutch facing, composed of heat-resisting material similar to that used as brake linings on jet planes. It is claimed that the clutch gives more rapid and positive engagement with better heat-resisting and power-holding characteristics. Drawbar hp on the TD-18, has been increased to 103, moving it well up with the big crawler field. The TD-18 produces 124 hp at 1,450 rpm and the drawbar pull is 24,300 lb. Other engineering changes are the new 500-hr track roller seals, a heavier radiator guard and an improved streamlined appearance that aids operator visibility. International's fast gasoline-conversion, electric starting system is provided as standard equipment on the TD-18. On the TD-14, above, the drawbar hp has been increased to 78.5 and belt hp has been increased to 89.5. Like the other redesigned tractors, the TD-14 is equipped with new hydraulic steering clutch boosters. As on the TD-18, the TD-14's radiator guards are hinged to permit easy servicing



of front-end hydraulic pumps. The TD-9 drawbar hp has been increased to 54.5 and the belt horsepower is increased to 66. A new foldover seat facilitates servicing of steering clutch assemblies. The TD-6, now rated at 41.5 hp, features a strengthened power train. The radiator grille and hood assembly of the TD-6 has been raised 3½ in. and the hood has been tapered to give the operator increased visibility of front-end operations. Instruments, above, have been grouped together in the center of the dashboard for instant reading and the steering control levers have been designed with spring boosters that reduce lever pull by 25%. **—International-Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**

BIGGER PAYLOADER—The largest in the line of Payloader tractor-shovels is the new model HO with a heaped capacity of 2¼ yd and a struck capacity of 1¾ yd. In addition to a power-shift transmission and a torque converter, the new unit is equipped with planetary axles and torque-proportioning differential. The latter adds to the effectiveness of four-wheel drive

(Continued on next page)

LAYKOLD Weathercoat

–a "permanent poncho" for exposed insulation

If you have "hot" or "cold" tanks, towers, vessels or piping exposed to the weather, you know the problem. Insulation must be kept *dry* to be effective. Weathercoat is the answer.

High-efficiency insulation insurance

Laykold Weathercoat is the best "raincoat" your units could have because it seals out not only water but also water vapor. In addition, Weathercoat stays "alive" through season after season.

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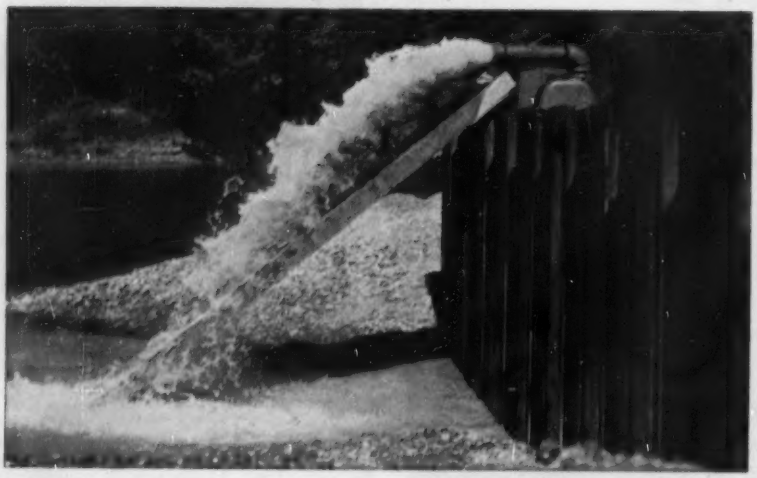
(advertisement)



Jaeger pumps know how to handle water

Two independent, simultaneous priming actions . . . fast and doubly sure. • Oversize shells and impellers, engines of largest horsepower applicable. • The only positively lubricated shaft seal with ready inspection port. • Prime without racing, pump at slower speeds, pump more thousands of hours. Performance guaranteed. Sizes 1½" to 10". See your Jaeger dealer or send for Catalog P4.

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Low-Shoring Jobs

. . . Ellis Offers the Method and Materials!

Proof that Ellis Methods can be adapted to any concrete forming job, here is illustrated the shore that eliminates measuring and cutting each shore to fit. Using a standard 7-foot Ellis lower shore member with clamps attached, a short upper member of desired length is inserted into the clamps. Two rows of nails (marked by arrows) are put in at the extreme limits of adjustment for the given job. With an "indicator" nail driven into the lower member at a fixed height, guide-lines can be marked on the upper member and keyed to line up with the indicator for various pre-determined shore lengths. This gives automatic measurement for end shores—and in-between shores slip into holders on purlins quickly and with no measuring. All shores are ready for re-use on another part of the job.

For suggested Ellis Methods to fit your particular job, without obligation, send structural plans or description to:

Ellis MFG. CO., INC.

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by combating wheel slippage. When the wheel on one side encounters poor tractive conditions, the torque-proportioning differential automatically delivers more power to the opposite wheel. Other features include 40-deg breakout at ground level, a hydraulic load-shock absorber, 12-v electrical system, and four-wheel hydraulic brakes. The new model is available with either gasoline or diesel power. — **The Frank G. Hough Co., Libertyville, Ill**

HYDRAULIC RIPPER—American Tractor Equipment Corp. has designed a retractable hydraulic scarifier for Caterpillar Traxcavator models 977, 955 and 933. A rigid, single-unit assembly with drawbar and cylinder supports, the ripper is easily installed and does not interfere with the operation or servicing of the Traxcavator. Two cylinders raise and lower the heavy-duty frame, which accommodates up to five curved scarifier shanks. Shank connections are pinned and may either be locked for bank ripping, or hinged to retract automatically when head frame is lifted. They are lowered by the bucket dump lever through an added valve that diverts this power to the scarifier. Curved shank design rolls material up and back of the head frame so that clogging of the shanks is minimized.—**American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif.**

IMPROVED FORMGRADER — Latest improvements in the Cleveland Formgrader, a machine used on road jobs to cut form trenches quickly and accurately, include power steering, hydraulically operated cutter lift bar and an improved self starter. According to the manufacturer, who credits power steering with increasing the machine's accuracy and performance, the new Formgrader has cut 6,840 lineal ft of trench in six hr under test conditions. Before operating the Formgrader, stakes and a guide line are set up at the re-

1. Alemite Loader Pumps . . .

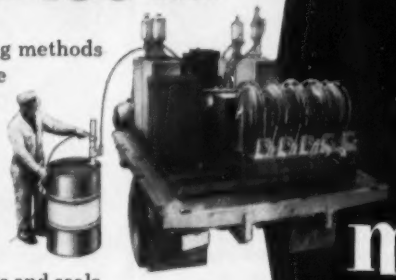
save 3¾ man-hours for every 100 lbs. of grease!

Alemite Loader Pumps put an end to slow, messy, hand loading of grease guns. They make sure *clean* grease is delivered to bearings, free of dust and grit that can cause a costly breakdown. Just a few strokes fill the gun with refinery-fresh lubricant. Models to fit and seal any original container—from a 400 lb. drum to a 25 lb. pail. Shown: Model 7181-L "Red-A" Loader Pump.

2. Alemite Power Transferring . . .

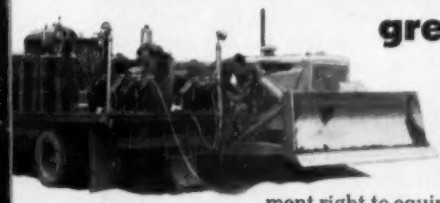
saves up to 63% of man-hours per 100 lbs.

Alemite *Power* transferring methods save important time—give vital protection! Here an air-operated Alemite Gusher Pump, Model 7216-A, refills lubricant tanks on a portable service station . . . transfers 37 pounds of pressure gun grease in just 60 seconds! Fits and seals original refinery drum . . . completely protects lubricant every step of the way!



3. Alemite Portable Service Stations . . .

save up to 95 man-hours for every 400 lbs. of grease!



Bring all the advantages of a complete lubrication department right to equipment in the field! No time lost—no more costly breakdowns due to improper or insufficient lubrication. Portable Service Stations provide all standard maintenance services—pressure gun grease, gear lube, oil, air and water. Save time, money, equipment!

Proof!

Alemite lubrication methods save time...money ...equipment!

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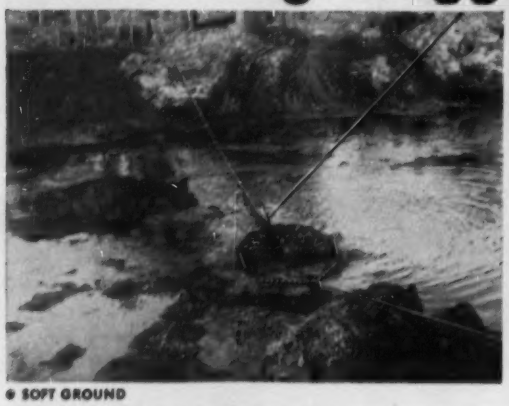


● SOFT GROUND

● DEEP WATER

● NARROW SPACE

● STEEP HILLS

Use A Sauerman DragScraper

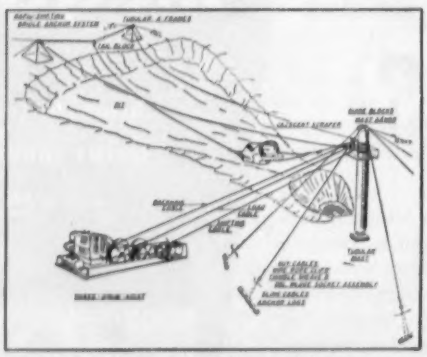
● **SOFT GROUND**—Sauerman DragScrapers work on surfaces where wheeled equipment cannot go and where mats are required to operate a dragline. The DragScraper digs and hauls its load quickly at ground level to hopper or pile. It carries a payload of two to three times its weight. You are not paying the power costs of a heavy machine with a handling capacity that is just a small portion of its weight.

● **NARROW SPACE**—A DragScraper can be operated through an opening no larger than the bucket's width. They are used successfully in culverts, sewers, tunnels, under bridges and buildings. Locations with limited space and head room . . . unworkable with other equipment . . . are handled efficiently and economically with a DragScraper.

● **DEEP WATER**—A Sauerman DragScraper will dig as much as 100 ft. below water . . . this is far below the safe depth that a dragline bucket can go without the danger of undermining and overturning the machine. Use a DragScraper for trenching, digging channels, lakes or for beach construction.

● **STEEP HILLS**—These are routine for a DragScraper. Material can be taken from anywhere on the bank. Digging from the top of the slope eliminates cave-ins—and the DragScraper gives an extra bonus by pushing additional material in front of the bucket on its way down the slope.

The Sauerman DragScraper operator and hoist is always located away from any hazardous area. It is designed for years of safe, continuous duty, handling bucket sizes up to 15-cu. yds. over spans to 1000 ft. or more.



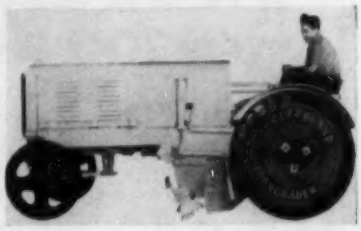
THE SAUERMAN METHOD—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

When you have a "tough-to-handle" job consult Sauerman engineers about Sauerman equipment and the Sauerman Method. Request Catalog A, also the Sauerman News and field reports.

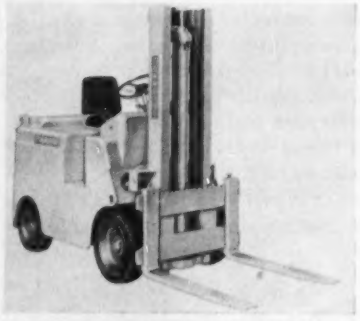
SAUERMAN BROS., INC. 612 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

EQUIPMENT NEWS . . . Continued



quired height. The operator simply sees that the line gage on the machine follows the guide line. Because the line gage on the machine is kept level by a pendulum controlled shaft, the trench is cut to the proper depth regardless of the unevenness of the ground. The Formgrader has a heavily weighted drive wheel that follows in the path of the cutter blade and simultaneously compacts and rolls the trench to prepare it for forms. The machine is also available with a crawler mounting. — **Cleveland Formgrader Co., Mills Road, Avon, Ohio.**



FORK LIFT TRUCK—Precision power steering, fast automatic transmissions, and more positive-action hydraulic systems are among features of a new line of Towmotor fork lift trucks. Called the Pace-Maker series, the trucks are available in four basic models with lifting capacities ranging from 6,000 to 11,000 lb. Gasoline, diesel, and L-P gas power units are available. The trucks also feature Towmotors "creep control" which permit the operator to inch his truck slowly forward while maintaining maximum engine speed for lifting. **—Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.**

NEW DRAGLINE BUCKETS — A completely new line of dragline buckets, offered with either solid or perforated baskets, has been announced by Bucyrus-Erie Co. According to the manufacturer, the new dragline buckets are strong, yet far lighter than those previous-

ly offered. They are made of Becoloy, a steel alloy developed by company metallurgists specifically for dragline bucket service. Three types are available in a wide range of sizes: the BL for light duty digging in materials with resistance to penetration similar to that of loose gravel or clay; the BM for medium-duty digging in material with penetration similar to light shale or cemented gravel; and the BH for heavy-duty digging. — **Bucyrus-Erie Co., South Milwaukee, Wis.**

MAGNETIC LEVEL—A new torpedo level just introduced by Stanley Tools leaves both hands free to work because it is equipped with a lifetime Alnico magnet that holds the tool securely on ferrous surfaces. The new level has three glasses—plumb, level and 45 deg. Because of its tapered design, the level slips in and out of pockets easily. The retail price is $4.30.— **Stanley Tools, 111 Elm St., New Britain, Conn.**

MATERIALS HANDLER — Specially designed for construction materials handling, The Rinson NF60 fork lift truck has 8-in. ground clearance, and a semi-rigid frame that permits maneuverability over rough terrain. Powered by a 115-hp Ford industrial engine, the truck employs many standard

NOW, FOR FIRST TIME . . . INSTALL

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WITH

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POWDER ACTUATED TOOLS

Omark DRIVE-IT® Gives These Advantages:

- **SPEED.** Cuts installation time as much as one-half over other methods.
- **STRENGTH.** Stronger, longer lasting, watertight, wind resistant, corrosion proof fastening.
- **SIMPLICITY.** Easy operating *Omark DRIVE-IT* tools are portable, self powered, lightweight. Sales and service nationwide.
- **UTILITY.** Roof can be removed for renovations without tearing.

Corrugated aluminum on steel structures is installed quicker, easier with *Omark DRIVE-IT* powder actuated fastening method. Newly developed special drivepins and insulated cap nut prevent electrolytic corrosion.

It's this simple: Lay out roofing or siding on steel framing, drive special drivepin through aluminum into the steel; place insulating waterproof washer and cap nut on the drivepin. Actual job tests prove time and cost savings up to one-half over other methods.

See Your Dealer for Demonstration or Mail Coupon for More Information

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I want more information on fastening corrugated aluminum with Omark DRIVE-IT tools.

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- **CONTROL FOOLPROOF AND SIMPLE** To be operated by unskilled personnel. Full-vision cab.
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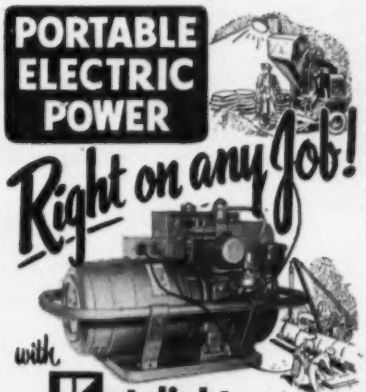
FULL-HYDRAULIC EXCAVATOR

DEMAG BAGGERFABRIK GMBH DÜSSELDORF BENRATH

PORTABLE ELECTRIC POWER

Right on any Job!



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EQUIPMENT NEWS . . . Continued

Fork truck parts. The truck has been designed so that it can be towed safely at highway speeds, thanks to a truck-type steering-axle, built-in tow bar, safety chains, and a tie-in braking system. Stop and tail lights are standard front and rear. The forks tip back when the truck is being towed to reduce over-all length. Lifting capacity is set at 4,000 lb on 24-in. load centers. Lifting height is 104 in. The truck measures 118 in. long, 58 in. wide and 88 in. high.—**C. Rinkin & H. Olson, 725 E. Huntington Drive, Monrovia, Calif.**

NEW SCOOPMOBILE — Four-wheel steering, two-axle oscillation and increased operator visibility are features of the new model LD5T Scoopmobile The new 1-yd, 5,000-lb capacity front-end loader will transport a full load with the bucket raised off the ground just enough to clear the terrain. This gives the operator the same degree of visibility while traveling with a load as he has when picking it up, since the bucket does not have to come up into his line of vision. Two-wheel oscillation permits one wheel to drop into a hole in rough terrain without loss of tractive power to that wheel. Standard equipment includes torque converter, planetary drive, power steering, reversing transmission, and four-wheel brakes, steering and drive.—**Mixermobile Manufacturers, Inc., Portland 20, Oregon.**

BOOMSNUBS—Called "hydraulic cushions," Boomsnubs hydraulically check boom backlash caused by sudden loss of crane loads. Because the momentum of recoil is stopped almost completely, block and hook throw are also prevented. Light and compact, Boomsnubs do not hamper crane operation nor do they interfere with the operator's vision. The Boomsnub is an arm made of two telescopic steel tubes containing hydraulic oil. The inside piston is closed at the lower end except for small valve openings that hold a constant supply of oil

"NO MORE LUBRICATION TROUBLES"

—says STEPHENS-ADAMSON MFG. CO.
Conveyor Mfr., Aurora, Ill.

"LUBRIPLATE Lubricants satisfy the 'one-shot' requirements of our conveyor idlers. LUBRIPLATE effectively lubricates each bearing in turn and flows through the hollow shaft to the next bearing. We do not know of a single case of bearing trouble through faulty lubrication where LUBRIPLATE has been used."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

ELIMINATE THIS DANGER ZONE!

Hook on load block

Hook with jaw and jaw-type ball for link chain

Hook with adapter nut for all types of pullers

You can eliminate this danger zone under any hoist, crane, or other lifting equipment with Bullard-Burnham safety hooks. A pushbutton safety gate makes it impossible for loads to jar loose until the hook is manually unlocked, and also acts as a constant safety gauge indicating whether or not the hook is sprung. Notice that the safety gate leaves the hook's throat 100% clear. The heavy duty safety gate is non-corrosive brass with a stainless steel lock pin that will last for years.

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BULLARD

EQUIPMENT NEWS... Continued

against the piston head, yet allow enough oil to flow from one tube to the other for normal operation. Sudden recoil causes a spring-loaded valve to open, allowing more oil to flow but providing enough resistance to bring the boom to a stop within 2 or 3 deg of rotation. For boom equalization, the manufacturers recommend that they be installed in pairs. They are available with 3, 3½ and 3¾-in. piston sizes to fit cranes with capacities ranging from ½ to 3½ yd. Special sizes are available on order.—**Boomsnub Co., 201 S. E. Oak St., Portland 14, Oregon.**

FLAME CUTTER—A new portable flame cutting and pipe beveling machine is said to be ideal for handling small pipe with diameters of from 1½ to 4 in. Weighing only 7½ lb, the new cutter uses the same split-gear horseshoe principle that characterizes H&M's larger units for pipe up to 36 in. Called the Model O machine, the unit can handle many pipe sizes by replacing precision-made adapters. Any plain-barrel machine cutting torch may be used with the unit. In a recent field test, one machine completed 5,500 bevels in ten days, and it was operated by unskilled personnel. — **H&M Pipe Beveling Machine Co., Tulsa, Okla.**

TUBELESS TIRES—Tubeless tires have become standard equipment on Caterpillar No. 12 and 112 motor graders. The new tires provide a number of advantages over tires with tubes, including easier and faster mounting and dismounting, lower running temperatures, and fewer blowouts. Tubeless tires will also be furnished when optional tire sizes are ordered.—**Caterpillar Tractor Co., Peoria, Ill.**

(Continued on page 220)

This new Michigan Turbo-Dozer, manufactured by the Clark Equipment Company, Benton Harbor, Michigan, is a very versatile, maneuverable tool. It can rip out trees, doze out 2¾ cubic yards of dirt at one bite, and move from one job to another at truck speeds. One good reason for its strength and maneuverability is the use of sturdy, durable USS MAN-TEN Steel in vital parts. These sample dimensions—blade 5/16", end wing ½", push beam 1¾", and stiffener beam 1" x 3"—show how USS MAN-TEN steel was used to maintain strength and also trim off excess deadweight.

USS MAN-TEN High Strength Steel

contributes to maneuverability of new Michigan Turbo-Dozer

If it hadn't been for USS MAN-TEN High Strength Steel, this new Michigan Turbo-Dozer might never have seen the light of day. USS MAN-TEN Steel was used extensively in its construction—for the entire blade assembly, the "C" assembly and the stiffener plates. If these vital parts had been built from mild steel, they would have been so heavy that the machine would be too ponderous to operate efficiently. This is another outstanding example of the way USS MAN-TEN High Strength Steel can be used in many kinds of earthmoving equipment to increase strength and durability, and at the same time hold weight down to practical limits.

The three USS High Strength Steels—USS MAN-TEN, USS COR-TEN and USS TRI-TEN—have a 50% higher yield point than ordinary carbon steel. They have better atmospheric corrosion resistance, and offer greater resistance to wear, impact and fatigue. When used in vital parts of equipment they can (1) increase its service life without increasing deadweight, or (2) increase its size and capacity without increasing its total weight or the power *needed to move it*. In addition, USS MAN-TEN has certain other specific properties which made its use especially valuable to equipment like this Turbo-Dozer. These properties include workability, weldability and excellent resistance to abrasion even under tough, rocky conditions.

NOW AVAILABLE

Our "Design Manual for High Strength Steels" contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead, giving your title or department, to United States Steel Corporation, Room 5311, 525 William Penn Place, Pittsburgh 30, Pa.

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UNITED STATES STEEL

Specify—
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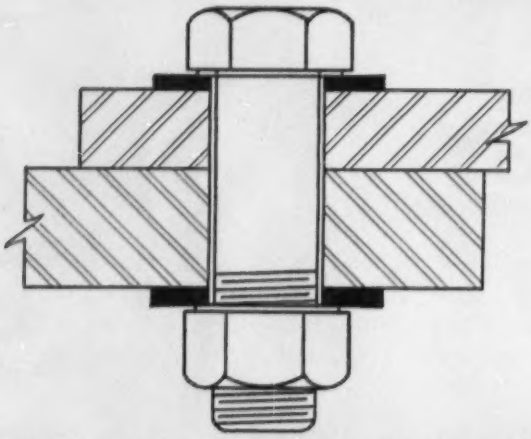

for GREATER CLAMPING FORCE in High Strength Steel Bolting

Structural engineers and contractors *know* today that high strength steel bolts, *with properly hardened MIL-CARB* steel washers,* provide a form of steel jointing superior to riveting in many ways . . . including faster, more economical construction.

Don't overlook the fact that *no bolt is any better than its washers!* Don't let washers be the weak link in your steel framing construction chain. MIL-CARB carburizing permits *securing* and *holding* desired tension — eliminates "galling" or grinding of washer by the nut, *assuring permanent, uniformly strong, tight joints.*

MIL-CARB Washers are fabricated from Prime Carburizing Quality Special Soundness Steel to insure uniform quality control, always equal to or exceeding the rigid specifications for high strength bolted steel construction.

For your own protection and for uniformly sound construction, specify MIL-CARB* Carburized Washers and accept no substitutes.

Since 1887

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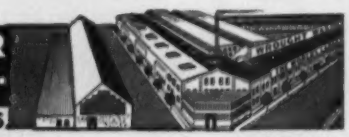


A 8798-3/5

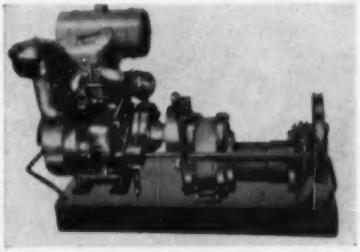
EQUIPMENT NEWS...

Continued from page 218

HYDRAULIC TROWELS—A hydraulic system controlled by a finger-tip lever on the handle changes blade pitch on a new line of trowels introduced by Kelley Machine Div. of the Wiesner-Rapp Co. Because of the cushioning effect of the hydraulic system, said to be the first on a machine of this type, the machine will not tip or jolt if it hits a loose piece of aggregate while floating, leveling or troweling concrete surfaces. Center of gravity of the new trowels is only 6½ in. above the blades. This feature, combined with an extra long handle with widely-spaced grips, gives increased leverage and ease of operation. Four blades are independently mounted on the guard ring so that the blades cannot be misaligned when the machine is picked up and carried by the guard ring. Three 34-in. models and three 44-in. models, each with gasoline or electric power unit options are available.—**Kelley Machine Div., Wiesner-Rapp Co., 285 Hinman Ave, Buffalo 23, N. Y.**

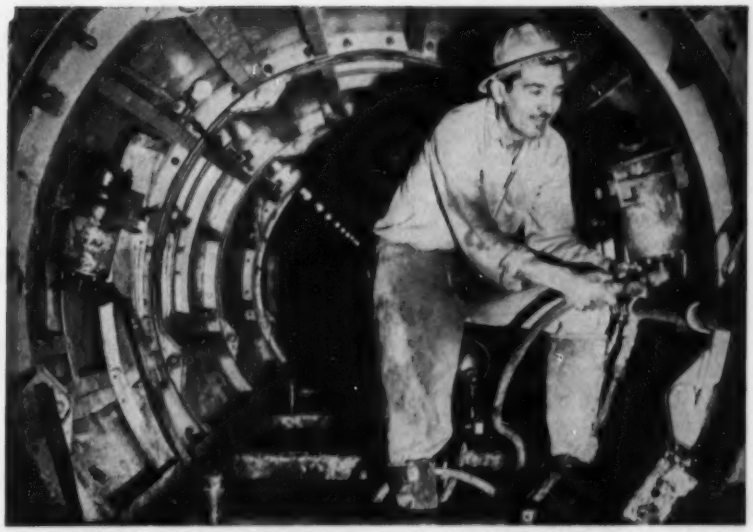
ADJUSTABLE TRIPOD — Telescopic legs, adjustable in 6-in. increments, permit the Magic-Pole tripod to be set upon ramps, plat-

forms or rough ground without digging in the uphill leg. The illustrated model extends to a working height of 10 ft 3 in., yet closes to a convenient 6½ ft for easy handling and storage. Completely rust resistant, the tripods are engineered of a combination of steel and aluminum alloys that reduce weight and provide added strength. A special screw on the base permits firm setups on almost any surface. **—B. E. Wallace Products Co., Exton 20, Pa.**



PULLERS — The Sasgen Derrick Co. has added a new line of power pullers to its popular power hoist line. The pullers are available in 16 models with load capacities ranging from 500 to 2000 lb, with ratings ranging from ¾ to 7½ hp. Two of the pullers, the 6 and the 7½ hp models, are gas engine powered and the others are electric powered. Each model has a 32x12-in. base of formed steel as an operating platform. Drum capacity for each unit is 250 ft of ¼-in. steel cable with tested strength of over 5,000 lb pull. Double reduction spur gears of high tensile steel are driven by high-torque, repulsion-induction type motors through shock-absorbing flexible couplings. Gears run in continuous oil bath and all shafts are ball bearing mounted. **— Sasgen Derrick Co., Dept. CML, 3101 W. Grand Ave., Chicago 22, Ill.**

VERSATILE PHONE—In addition to serving as a low-cost two-to-ten station inter-office system, the Di-



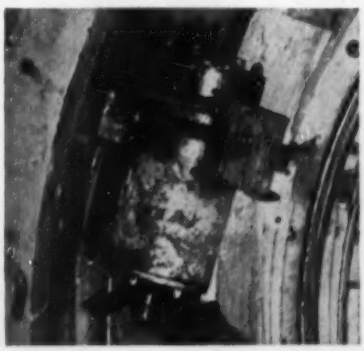
WORKER OPERATES one of the two Viber external form vibrators used on 2.9 mile sewer tunnel job. Vibrators are clamped to form and moved forward as concrete slope advances.

Two Movable External Vibrators Consolidate Concrete in La Cienega And San Fernando Relief Sewer

MAJOR PROBLEM of congested sewers in Los Angeles' heavily populated San Fernando Valley is being alleviated by a 2.9 mile long sewer tunnel bored through the Hollywood Hills.

The La Cienega and San Fernando relief sewer tunnel was holed through in horseshoe shape with a minimum diameter of 7 ft. 9 in. During lining, it was made circular with a 6 ft. diameter. Kemper Construction Company, Los Angeles, headed lining operations.

The Kemper crew prepared approximately 135 cubic yards of concrete daily at a batch plant at the tunnel's entrance and hauled it by 24-gauge train to work site.



VIBER MODEL PX high speed pneumatic vibrator shown mounted on form in sewer tunnel. Model PX is used widely in tunnel lining operations.

Once concrete was discharged on top of T-Lock lining forms and flow commenced around full-circle forms, two external Viber Model PX high speed pneumatic vibrators were used to consolidate it rapidly and completely. Vibrators were clamped to the form and moved forward as concrete slope advanced. A Viber internal vibrator was sometimes used in conjunction with the external vibrators.

Highly experienced in tunnel lining, Kemper Construction Company designed the vibrator mounting clamp to fit the needs of this job. Clamp hangs from angle rail which extends length of form section. As slope advances, clamp may be released to switch vibrator to new position along rail without lifting it from rail.

Viber Model PX vibrators are used widely in tunnel lining operations. They are also used effectively in manufacturing concrete pipe and other precast members wherever reusable steel forms are set up on a production basis.

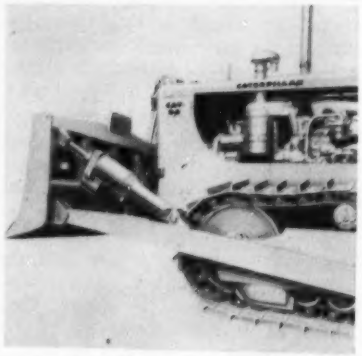
For further information on Viber's complete line of internal and external vibrators, contact your authorized distributor or Viber Company, Dept. 8-B, 726 S. Flower Street, Burbank, Calif.

VIBER

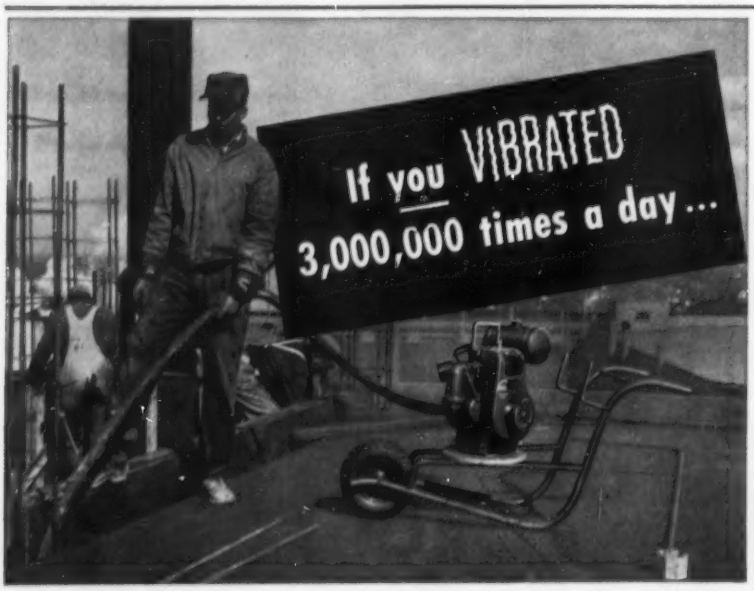
CONCRETE VIBRATORS SINCE 1931

rect-A-Call system offers such additional services as a two-way loud speaker station, voice paging, conference circuit, and loud bell signals for noisy areas. The new telephone, which operates from a standard electrical outlet without batteries or tubes, is so compact that it takes only 4x6-in. of space. Molded of impact-resisting thermoplastic, the system is so simple to install the purchaser can do it himself. The compact power supply, measuring 3 1/16 in. high, 4⅝ in. long, and 3 5/16 in. wide is simply plugged into any 110-v outlet. Color-coded wires leading from the power supply are attached to the telephones at their desired location without soldered connections. — **Connecticut Telephone & Electric Corp., Meriden, Conn.**

TILTS BLADE—A new hydraulically actuated tilting attachment for



use with Caterpillar No. 9S and 8S bulldozers is designed to increase the versatility of the D8 and D9 tractors on such jobs as ditching, digging rocks, and other applications which require frequent tilting of the blade. Heart of the new attachment is a large hydraulic cylinder that replaces the left bulldozer blade brace. With the right-hand brace adjusted to its neutral position, either corner of the 9S blade can be raised 28 in. above ground level by retracting or extending the tilt cylinder. On the 8S the blade can be raised 24 in. New bulldozer trunnions, designed to take full advantage of the maximum available tilt, are furnished with all new 9S and 8S dozers. The tilt cylinder is controlled from the operator's seat by means of a front-mounted or rear-mounted hydraulic control.—**Caterpillar Tractor Co., Peoria, Ill.**



...you'd have to be rugged. *Masters are.*

Few pieces of equipment have to take this kind of a beating. 9,500 to 12,000 vibrations per minute against abrasive bits of stone, in wet cement. Imagine yourself inside one. Rough!

That's why it pays to buy *only the best* in vibrators... and why the *service* you get is just as important as the vibrator itself.

No flexible shaft vibrator is made with more care or better materials, than the Master ... and our nearest distributor is ready with the service you want. He handles a complete line of gasoline and electric powered vibrators for any vibrating job. Try him. See for yourself.

For full information, specifications and prices on any Master product, see your Master distributor. There's no obligation ... he's glad to help you.

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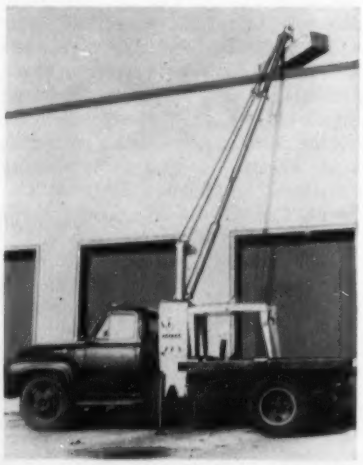
MASTER



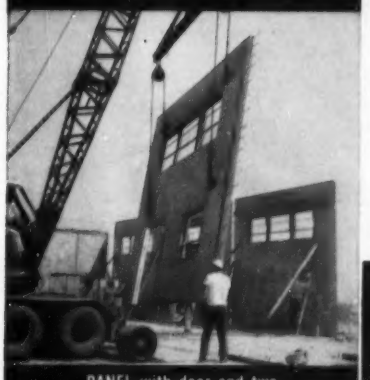
COMPACT LOADER — Compact and readily accessible, the Daybrook-Woodside power loader fits any standard truck chassis and is operated from a power take-off through the engine transmission.

(Continued on page 224)

PRECAST PANEL 32' high, 18½' wide with two large window areas.

TRUSS has 60' span at top

114,000 LB. SLAB being positioned



PANEL with door and two window areas

SUPERIOR

Complete Accessories Plus Experience on Tilt-Up Jobs!

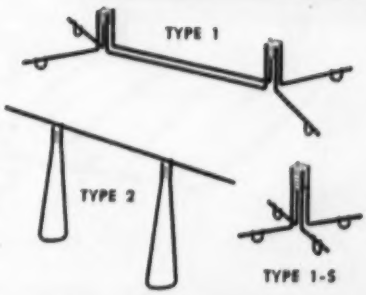
On every Tilt-Up job the proper type of Pick-Up Inserts and Brace Anchors as well as their location in the slab or precast structural member are of prime importance in order to withstand the stresses occurring when *tilting, lifting,* and *positioning.* As pioneers in this field, SUPERIOR has developed various types of accessories and correct procedures resulting from the experience of thousands of job applications.

SUPERIOR accessories are designed for fast and efficient handling of all types of precast panels and structural members. The Pick-Up Insert provides dependable anchorage for bolts which secure a lifting angle to which slings are attached when the panel is raised. Brace Anchors secure the temporary bolts by which the Braces are attached. The exclusive pivoting action of the adjustable Braces permits quick positioning and alignment of panels. Braces are assembled with 2 x 4's or pipe of lengths to fit job conditions.

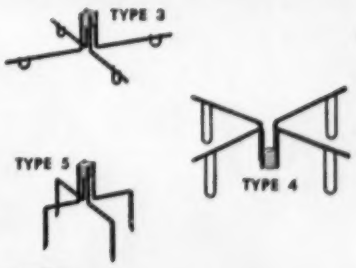
The many types of SUPERIOR Inserts, Anchors, and Braces for every job condition together with complete layout service provide a combination which offers safe and efficient handling of precast panels and structural members.

For further details refer to Sweet's Catalog or send for BULLETIN TU-3.

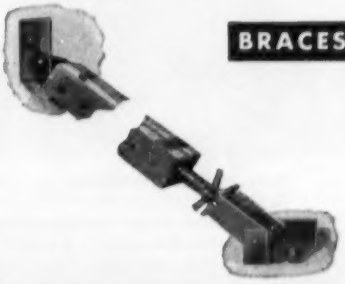
PICK-UP INSERTS



ANCHORS for BRACES



BRACES



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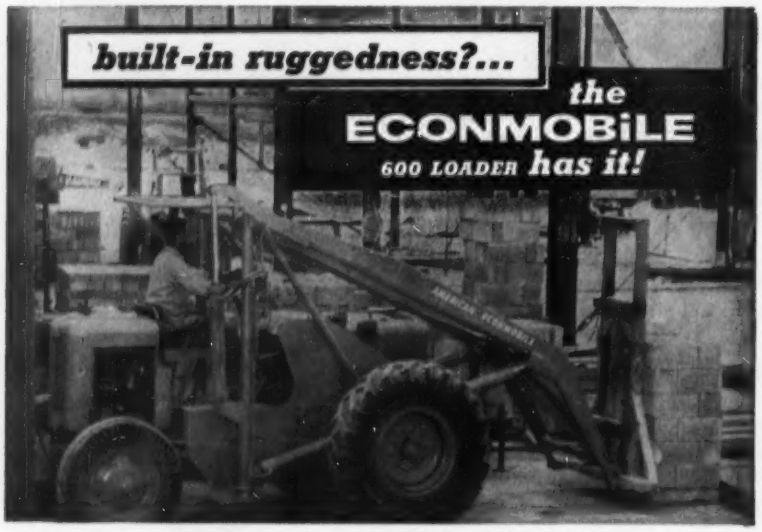
Correctly engineered to bear heavier loads, lengthen rope-life, reduce maintenance costs

• Because they're designed and engineered for specific tasks, you'll find MADESCO blocks with heavy steel shells and fittings your *safest* choice. In materials, in construction too, Madesco tackle blocks assure you the extra service that comes from over thirty years of specialized experience and "know-how." Buy Madesco blocks and you make substantial savings on your rope costs, because Madesco sheaves (of iron or steel graphite bronze) are correctly-grooved to prolong rope-life. Loads travel smoothly, easily, quickly to save lifting time; that means savings too that come from minimized maintenance and down-time. There's a complete line of Madesco tackle blocks for every need. Consult your industrial distributor—and meantime write for our catalog.

WORTH ASKING FOR—BY NAME

MADESCO BLOCKS

MADESCO TACKLE BLOCK CO., Easton, Pa.



Outstanding performance is guaranteed by the fact that the ECONMOBILE has been 100% stressed at every point. And—with the loader carried over the large rear tires—the load is properly distributed throughout the entire chassis.

The ECONMOBILE has these other outstanding features: Hoisting height up to 22'; reach up to 6'; power; stability; versatility; mobility; maneuverability; traction and flotation.

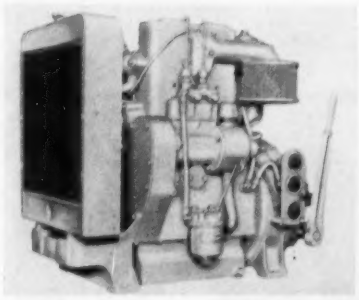
The savings in general labor effected through the use of the ECONMOBILE exceeds 70%.

write, wire or call

AMERICAN ROAD EQUIPMENT COMPANY
4318 North 28th Street Omaha, Nebraska
Phone PLeasant 2575

EQUIPMENT NEWS ... Continued

The all-hydraulically operated boom lifts, swings, and lowers loads up to a capacity of 4,000 lb quickly and safely. The boom swings in a 360-deg arc so that loads can be spotted from anywhere on the truck body. Standard unit has a 12-ft hydraulic boom and hydraulic stabilizers for side loading and unloading. Several optional boom lengths and extensions are available.—**Daybrook Hydraulic Div., L. A Young Spring & Wire Corp., Bowling Green, Ohio.**

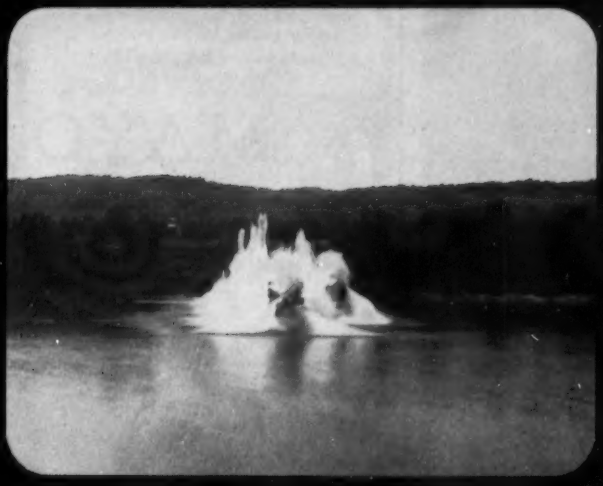


COMPACT DIESEL—Said to compare with 20-hp gasoline engines in size, weight and price, the 20-hp Model 17A Sheppard diesel unit has two cylinders, a 3½-in. bore, 4-in. stroke, and 76.8-cu. in. displacement. The fan-to-flywheel unit is only 26 in. high, 22¼ in. long, and less than 17 in. wide. It weighs 435 lb. In addition to the basic fan-to-flywheel unit, the model 17A is also offered as an open power unit, a standard power unit, and a closed power unit, to meet a variety of conditions. It is also available as a 5 to 7½-kw generating set as a source of auxiliary or prime power.—**R. H. Sheppard Co., Hanover, Pa.**

CRANE CARRIERS—Federal Motor Truck Co., a division of Napco Industries, Inc., has released for production its new 8- and 10-ton 6x6 crane carriers. The new carriers are powered by 265-cu in. Chrysler gasoline engines with four-speed transmissions and dual range transfer cases that give eight

"A good, clean ditch . . . ready for the pipe!"

This is the blast site: the Ohio River near Greenup, Ky. The job: dig a good, clean ditch for a pipeline crossing. The shot: second in a series of three . . . this one from the Kentucky shore. The method: blast it with Atlas explosives and modern techniques.



Excellent shot! Blast lifts shattered sandstone and limestone from river bottom . . . throws muck clear of ditch. Contractor will not be held up for clean up on this job.

Blast at its height shows tremendous heaving power of Atlas explosives, properly applied. The river crossing was a huge success . . . pipeline pushed through right on schedule.

Another successful river crossing shot . . . *with Atlas Explosives!*

Look at the way the rock flies. Up and out! High and clear! That's efficient shooting. Pentzien, Inc., Omaha, Neb. is crossing the Ohio . . . and it's Atlas all the way. Here's a good clean ditch . . . ready for the pipe.

When you're contracting a pipeline job, you can't afford the time or expense for secondary "clean up" shooting. Tight schedules demand you shoot it right the first time. So whenever you can, it pays to shoot it carefully and thoroughly. Pennies extra for explosives can mean dollars saved on the job.

Before your next blast, why not go over your specific problems with your Atlas representative? He'll help you get the most out of your blasting methods, your explosives and your caps. And get "Better Blasting" —Atlas' informative newsletter on latest methods and materials. Write us today.

EXPLOSIVES DEPARTMENT
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

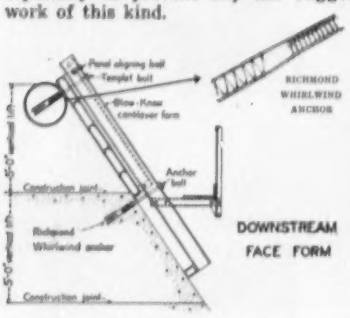
(Advertisement)

Massive Pours

Merritt-Chapman & Scott and The Savin Construction Corp., contractors, used 55,800 Richmond Whirlwind Anchors without slip or spall in this vast dam construction at American River, Folsom, California.

Economies with Richmond Whirlwind Anchor

In dam construction like the above, considerable speed and economy are to be gained by pouring successive monoliths in 5 ft. lifts into steel cantilevered forms. Success of this money-saving method depends, however, on one-point form anchorage that will positively withstand massive overhead pours and loads imposed from all directions. Richmond's *Whirlwind* anchor was designed especially to prevent slip for rugged work of this kind.



These Richmond anchors are mounted on the form before each monolith is started. Installation is easy. The *Whirlwind* is made with double coils, one coil takes the form bolt, the other supplies added anchorage to prevent slip in concrete during its low early strength period. There is no spalling. Richmond's development of these special anchors has been in large part responsible for the constantly increasing popularity of this fast, more economical, anchorage and pouring method.

For more information, or a copy of the Richmond Handbook of tying devices, anchorages and accessories for concrete construction, write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 S. 4th St., St. Joseph, Mo.

EQUIPMENT NEWS... Continued

forward and two reverse speeds. Tires are 7.50x20, 8-ply. Frame rails are heavy duty, 8x12-in., 45-lb wide flanged beams in the 8-ton unit and 12x12-in., 65-lb wide flanged beams in the 10-ton carrier. The front driving axle has a 10,000-lb capacity and the rear bogie has a 28,000-lb capacity. Optional equipment includes front and rear outriggers, rear fenders, power steering, heater and defroster, and 8.25x20 or 9.00x20, 10-ply tires.—**Federal Motor Truck Co., Napco Industries, 834 N. 7th St. Minneapolis 11, Minn.**

HYDROCRANE CLAMSHELL — A new ¾-yd clamshell-type material handling bucket, for use with the truck-mounted, all-hydraulic H-5 Hydrocrane, has been developed by Bucyrus-Erie. Said to be faster operating than conventional cable-operated buckets, it is controlled by foot-operated selector valves that enable the operator to channel all of the machine's horsepower into the digging action. With two double acting hydraulic rams forcing the bucket bowls closed, no digging effort is lost through the hoisting action required to close cable-operated buckets. Lower ends of the rams are attached directly to the upper edge of the bowl sections and do not interfere with bucket capacity. Bowls are interchangeable with those of the ½-yd digging bucket on the Hydrocrane. To speed bucket changes, the tagline hose connection is equipped with a quick disconnect coupling and the change can be

MAYO PNEUMATIC GROUTER and "PEA SHOOTER"

Simple to Operate Highly Efficient

The Mayo Grouter quickly and easily places low-pressure grout in tunnels, mines, shafts, foundations, and subgrades. It also may be used to inject sodium silicate emulsions for stabilizing caving or running ground.

This versatile piece of equipment can readily be converted to a "Pea Shooter" for shooting Pea or "Bird's Eye" gravel back of liner plates and backpacking outside lagging plates.

Write for Free Catalog 13 for full details and specifications.

MAYO

EQUIPMENT TUNNEL AND MINE

LANCASTER, PA.

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...all worked out!

• Does away with laborious calculations. Simply locate the table covering the member you are designing, apply span and load requirements, then *read off* concrete dimensions and reinforcing steel data. Follows latest codes and practices. Ten-day, money-back guarantee. No C. O. D.'s please.

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8 Reasons Why UNI-FORM

Panels are the most widely used Prefabricated Form in the Industry

VERSATILITY

Uni-Form Panels will form straight, irregular, curved, battered walls . . . slabs, beams, columns, piers—everything from small house foundations to massive concrete structures.

COMPLETE — READY TO USE

The Uni-Form Panel System is complete, ready to use when it reaches the job. Eliminates field fabrication. Result: FASTER JOB STARTS.

FAST ERECTION

Simple assembly of easy to handle panels increases productivity of labor. Form more contact area per man hour with Uni-Form Panels.

AUTOMATIC ACCURACY

Assembly of Panels with Uni-Form Ties furnished for any wall thickness insures automatically accurate forming. Tie positively locks and spreads panels. No measuring . . . no guesswork.

LUMBER SAVINGS

You use less lumber in Uni-Forming. Steel-framed panels erect into a tight, rigid form requiring minimum alignment and bracing on 1 side only—regardless of height. Saves labor too.

FASTER STRIPPING

Less alignment and bracing lumber . . . fewer parts to remove means faster stripping, lower costs.

LONG LIFE

Rugged steel frame designed for fast pouring, cradles and protects plywood edges . . . permits maximum re-usage of plywood (actually 50 times or more) before replacement is necessary. Minimum panel maintenance required . . . lower material costs.

EXPERT ENGINEERING SERVICE

Universal's engineering staff and field engineers provide competent, specialized assistance, backed by over 40 years of experience in concrete forming.

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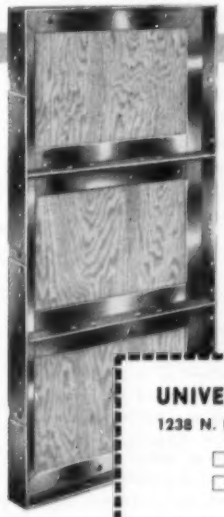
3 SIMPLE STEPS FOR ASSEMBLY

1. Insert Tie loop in Panel tie hole.

2. Tie Key locks Uni-Form Tie to Panel.

3. Tie loop receives adjacent Panel. Insertion of Tie Key completes tieing, locking and spreading operation.



3 BASIC ELEMENTS

UNI-FORM PANEL . . . Heavy duty — steel-framed, plywood faced.

UNI-FORM TIE . . . High strength, easy break-back.

UNI-FORM TIE KEY . . . Wedge shaped for fast, easy insertion and removal. Reusable.

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☐ Send me complete details on UNI-FORM Panel System.

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YOU NEED A CARCO WINCH TO HANDLE AN EMERGENCY LIKE THIS!

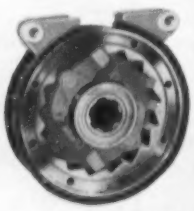
Here you see a typical construction emergency. In preparing the site for the new $8,000,000 Transport Division building of the Boeing Airplane Company at Renton, Washington, near Seattle, a 14-ton Bucyrus-Erie shovel bogged down in soft ground and was unable to move.

Do you, on your jobs, have the equipment needed to rescue such vital machinery quickly and economically so that your projects may move ahead on schedule?

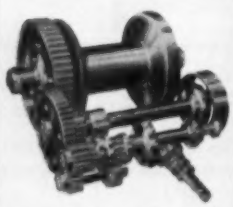
The Red and White Construction Company of Renton, Washington, did. They simply moved in a crawler tractor equipped with one of their two Carco Model F winches. With the tractor stationary, the Carco winch pulled out the shovel in jig time.

That Carco winches can handle the toughest construction assignments is shown by statement of Mr. G. W. Bristow, one of the two Red and White partners. "We know from experience that Carco winches are ruggedly built with a world of pulling power. Though one of our Carco winches is six years old, we have had no maintenance expense at all. To put it conservatively, our Carco winches have outlasted and outperformed other equipment."

Carco winches are used by many leading contractors on heavy construction projects. Let a Carco winch help you on your next job. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Illinois.



The automatic brake lets operator set brake before pulling in load. Brake takes effect when tractor clutch is thrown out, preventing load drop or slipback. Available at extra cost on Carco Model F.

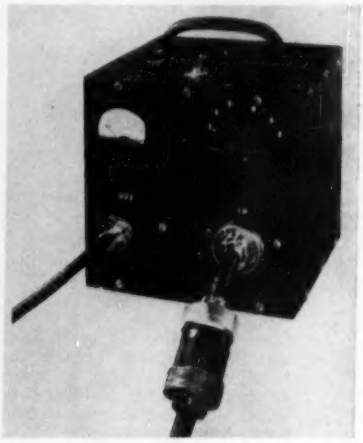


The constant mesh gear train with sliding internal gear clutch permits positive engagement and easy shifting. Power is transmitted directly through four-stage reduction gears. Model F handles all the power of tractor.

Through the years, Carco winches have earned a reputation for rugged stamina and for performance. As a result, Carco makes more winches for more makes and models of industrial tractors than any other producer.

CARCO®

made in a few seconds without tools or oil spillage.—**Bucyrus-Erie Co., South Milwaukee, Wis.**



BOOSTS VOLTAGE—The Portopower voltage booster is equipped with a voltage meter for checking delivered operating power and a 5 position voltage increase switch that gives a 10-v step-up at each position. In the operation of a portable power saw, for example, the Portopower unit can be attached to replace voltage lost through use of a long extension cord. Under these conditions, the voltage booster will recover the lost voltage and step up the operating speed of the saw. This eliminates the need for expensive power cord because 12-gage cord can now be used from power source to the point of operation, up to 1000 ft. The voltage out-put is enough to operate up to 3 saws at one time.—**Portopower Div., 1511 E. Nine Mile Rd., Ferndale 20, Mich.**

10-YD COBRETTE—CCS Wooldridge's new 10-yd heaped capacity, self-propelled scraper features fluid coupling drive, a positive power "gear steer" actuated by hydraulic rotary cylinders, and a specially designed frame and power train that permits one unit to push load another with ease. Rated at 7.5 yd struck, the rig also features an easily accessible gear transfer case that permits easy interchange of two standard gears

to provide optional gear ratios for more effective use of power. This change can be done in the field in two hours without special tools or extra parts, according to Wooldridge engineers. The new scraper is powered by a 143-hp diesel and offers speeds up to 30 mph. It is equipped with 18:00x25 tires that provide ample flotation and traction. The cable control unit is air actuated, as if the clutch and transmission. The "gear steer" system, consisting of two hydraulic rotary cylinders mounted on the scraper yoke and geared to the vertical king pin on the tractor, is said to provide maximum safety, ease of operation, and the maneuverability of full 90-deg steering. Features of the bowl include rear fulcrum leverage, pivot-tilt ejection, and low bowl profile with high ground clearance.—**Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Sunnyvale, Calif.**

D4 BACKHOE—The Hyster ½-yd hydraulic backhoe, designed for the Caterpillar D4 tractor, is capable of digging down to 13 ft and loading up to a height of 9 ft, 7½-in. A rack and gear swing mechanism, operating in an oil-tight case, provides full swing power at uniform speed throughout a 240-deg arc. The backhoe also features an equalizer that allows full track oscillation when negotiating rough terrain. Retractable hydraulic outriggers provide full machine stability, and convenient controls make possible easy and fast operation with good operator visibility. Dippers for the hydraulic backhoe are available in cutting widths of 13, 21, and 29 in. They are equipped with Esco replaceable alloy steel points, cripped onto adapters from the bottom for easy replacement. — **Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.**

Continued on next page

A grain elevator gets a good going over, *INSIDE, OUTSIDE!*

COMPLETE BREAK-THROUGH IN WALL

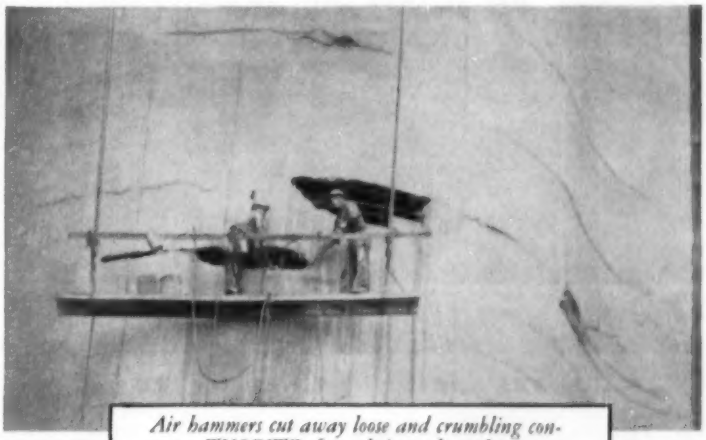
How to save this costly structure, without rebuilding sections, presented a serious problem.

Workmen on scaffolds, from inside and outside, cut out deteriorated concrete.

Necessity of costly forming was eliminated by the use of THORITE 20-minute set, nonshrink, filling and patching mortar.

THORITE

THORITE permits completion of job in one fall of scaffold, followed immediately by THOROSEAL seal coat.



Air hammers cut away loose and crumbling concrete. THORITE formed into cleaned-out sections, with a minimum labor cost, restored elevators to original condition.

Job completed with the application of THOROSEAL over entire structure.

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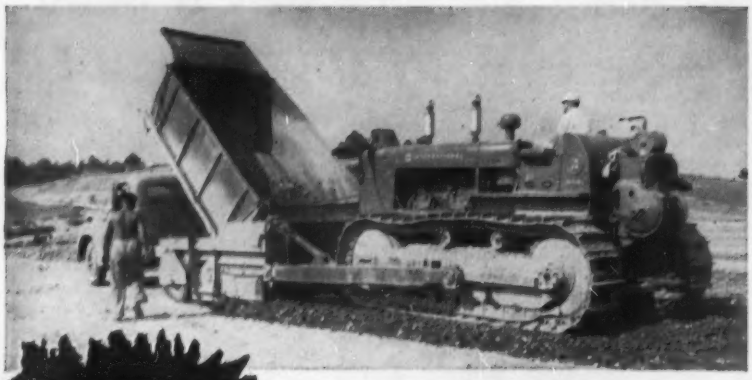

Owners report up to 1000 tons per hour with a Jersey Spreader !

In conjunction with the propelling tractor, a Jersey Spreader is the FASTEST, ACCURATE PAVING Spreader in the World! . . . It is capable of spreading up to 5,000 tons of aggregate daily—easily and economically . . . It has been successfully used on such projects as: the New Jersey Turnpike, the Ohio Turnpike, the West Virginia Turnpike, the New York Thruway, the Garden State Parkway, Chrysler Tank Testing Bowl, many of the most important new airports and on large defense bases in Iceland, Newfoundland, Arabia and Africa.

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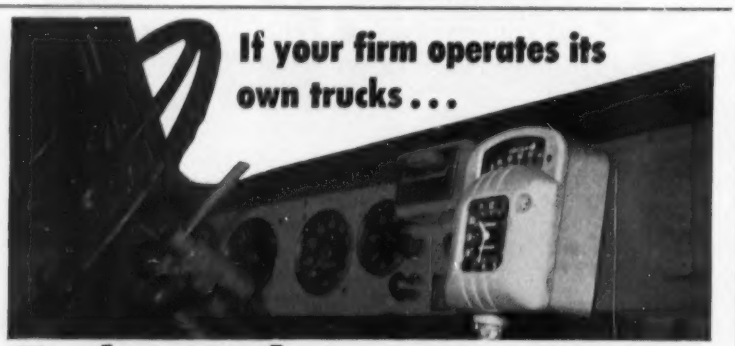

If your firm operates its own trucks . . .

Tachographs can protect and improve your operation three ways:

1. Promote safer driving habits
2. Cut down tire wear and fuel consumption
3. Reduce over-all maintenance costs

Making the investment in a Tachograph for every vehicle you operate is sound business. Hundreds of safety-minded, cost-conscious contractors everywhere have found this to be so.

As an accurate recording speedometer, the Tachograph automatically and permanently records vital trip information on an easy-to-read wax-coated chart. This chart shows when truck started, how fast it traveled, when it stopped, idling time and distance between stops. Illuminated dials on the face of the tamper-proof aluminum case show the time of day, miles per hour or revolutions per minute, depending upon type of instrument installed, and total mileage. A red light also warns driver whenever your company's predetermined speed limit is exceeded.

Use the coupon below to send for your free copy of Wagner Bulletin SU-3—it tells the *whole* Tachograph story and there is no obligation, of course.

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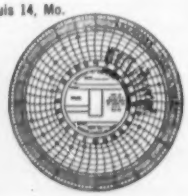
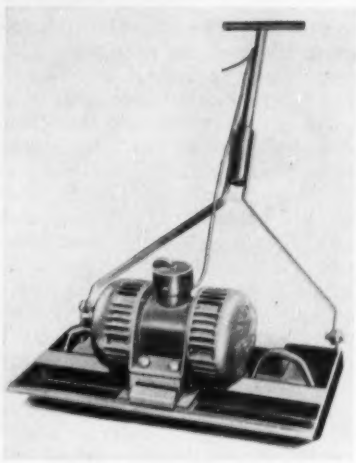
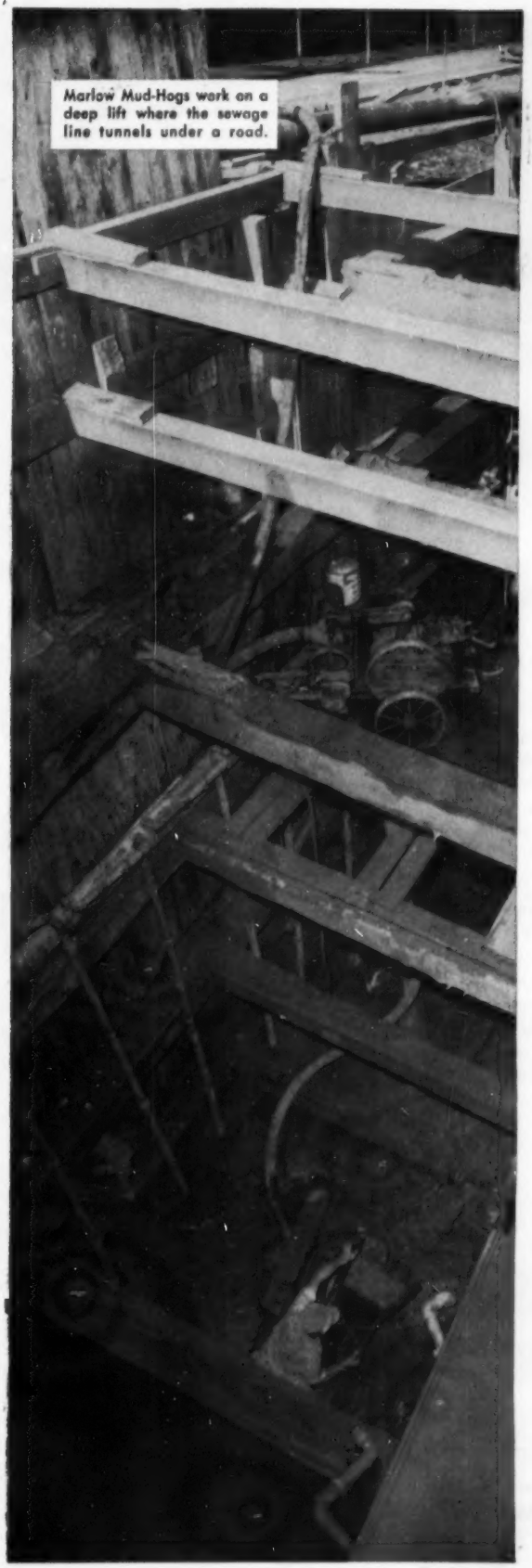




COMPACTOR AND FLOAT—The new Syntron-Sinex vibrating compactor and float has a 30-in. wide weighted float, is self-propelled, and develops 3,600 vpm. The self-contained electromechanical vibrator is mounted on a 30x18-in. heavy gage steel float of hydroplane design. It is totally enclosed and does not require lubrication. Detachable weights make the unit easily transportable from job to job. Designed for such jobs as road widening and patching, compacting dirt fills and compacting cover fill in trenches, the unit operates from 220-v, 3-phase, 60-cycle ac power.—**Syntron Co., 500 Lexington Ave., Homer City, Penn.**

INTERNATIONAL'S V-LINE—Nine series of trucks in conventional and cab-over-engine four- and six-wheel design, make up International's new V-Line of heavy-duty trucks. The new line features three new V-8 engines of 401, 461 and 549 cu. in. displacement with hp ratings of 206, 226, and 257, respectively. The trucks are available in models with gvw ratings of 24,000 lb and up, and with gross combination weights of 50,000 lb and up.—**International Harvester Co., 180 N. Michigan Ave., Chicago.**



Marlow Mud-Hogs work on a deep lift where the sewage line tunnels under a road.

Almost buried in mud, this Marlow Mud-Hog pumps efficiently near the site of the second sewage plant being built for the Jersey City Sewage Authority by the La Fera Contracting Company of Newark.

Marlow Mud-Hogs Solve Major Seepage Problem

Rugged pumping conditions on $30,000,000 sewage project

Garden State Constructors are currently working on a $30,000,000 project to extend sewage facilities from Bayonne to Secaucus, N. J., for the Jersey City Sewage Authority. There are two plants and two main trunk lines feeding these plants that are involved in this job. Work has been under-way for a year and will continue through 1956.

La Fera Contracting Co. of Newark, N. J., one of four contractors united in this joint venture, is handling the west side pipe line construction. They are installing approximately 25,000 feet of 42″ to 84″ pipe. Cuts run as deep as 30 feet below grade and all are below the Newark Bay sea level.

La Fera selected Marlow Mud-Hogs and used them 24-hours a day with minimum service interruptions and trouble. Frank Grosso, Equipment Superintendent, said, "We use Marlow Mud-Hogs because we found they outperformed all others." Over 15 Marlow Mud-Hogs are being used by La Fera. Other contractors on the same job are using about double this amount.

Because the pumps have performed so effectively, the job has run *ahead* of schedule, despite the constant water problem. Pep Rizzolo, La Fera Master Mechanic, said, "You can't beat Marlow Mud-Hogs for hard pulls involved in deep hole work such as we are doing now."

For a tough dewatering job you can depend on Marlow Mud-Hogs. They take all kinds of abuse and pass trash and debris without clogging. Write today for complete information.

Marlow PUMPS

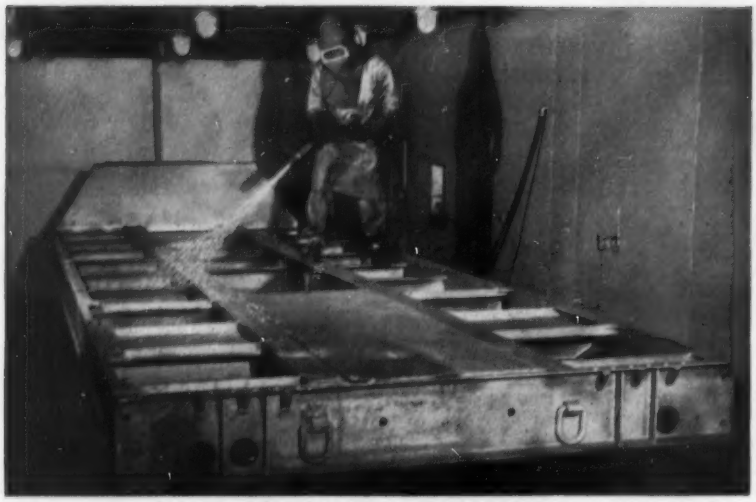
S-2998

MARLOW PUMPS

Division of Bell & Gossett Company

RIDGEWOOD, NEW JERSEY

Morton Grove, Illinois Longview, Texas



Shooting Trouble —before it starts!

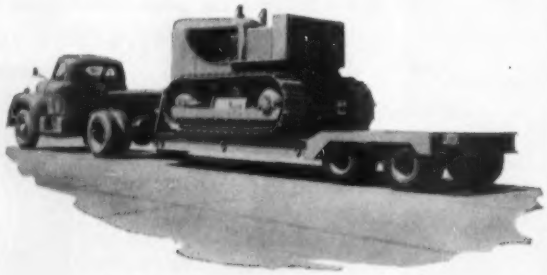
The hooded figure above is shooting abrasive steel shot under terrific pressure — to remove every spec of dirt and scale from the welded steel frame of a LaCrosse trailer. As a result, the asphalt-base paint sticks better, protects longer against weakening corrosion.

This expensive shot-blasting process is just one of many special *quality-control* measures, which are used to build *extra* value and performance into LaCrosse low-bed trailers. For example, LaCrosse is one of the few trailer manufacturers we know that uses automatic frame positioners, to insure *uniformly perfect welds*, by 100% "down-welding".

LaCrosse also builds and heat-treats its own axles, to provide better control of design and workmanship. Lengthwise LaCrosse oak decking is recessed for *minimum loading height*, and is securely levelled with Sealtite bolts, for extra strength and durability. In addition, each trailer platform is treated with special wood preservative, for extra long service life. Cast steel wheels save dead-weight, simplify tire alignment.

Remember, too, LaCrosse gives you *52 sq. in. more braking surface* than any other 4-wheel trailer — PLUS patented frame design which enables you to carry up to *1-ton more legal payload*. Choice of 80 different models — from 6 to 75-ton capacity — with flat, drop or tilting platforms. Write for details. LaCrosse Trailer Corp., LaCrosse, Wis. LC-37

24-ton capacity
LaCrosse DF6T tandem axle trailer, with 8' drop platform, has loading height of only 26". It weighs approx. 9000 lbs. equipped with (8) 8.25x15" tires.



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91 YRS. metal fabricating experience

LaCROSSE
VALUE LEADER IN LOW-BED TRAILERS

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

METAL LATHING — The 1956 edition of "Specifications for Metal Lathing and Furring" is now available for distribution by the Metal Lath Manufacturers Association. Covering all types of metal lath construction, the 16-p bulletin includes specifications for solid and hollow partitions, wall furring, metal lath attached to wood, and other applications. — **Metal Lath Manufacturers Assn., Engineers Bldg., Cleveland 14, Ohio.**

SOIL-CEMENT TESTING — The new edition of the "Soil-Cement Laboratory Handbook" contains up-to-date information on testing practices. The booklet includes modifications in practice that have reduced testing time by as much as 65% in recent years. Among recent changes discussed are the short-cut procedure for sandy soils, simplification of wet-dry and freezing-thaw tests and methods of testing soils for small projects. Copies are available free upon request. — **Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill.**

GUNNING EQUIPMENT — A new 16-p catalog contains answers to many of the questions often asked about air placed or gunned concrete. Also included are several pages of actual job application photos showing Air Placement's complete line of concrete gunning equipment. A description of the new Airplaco portable concrete gunning rig, a combination of equipment which forms a complete unit capable of handling construction, maintenance and restoration jobs, is also included. — **Air Placement Equipment Co., 1009-11 W. 24th St., Kansas City 8, Mo.**

BIG DRILL—Ingersoll-Rand is offering a 32-p comprehensive bulletin on its new Drillmaster 6½-in. blast hole drill. The bulletin describes crawler, truck and tractor-mounted applications and devotes a section to helpful rock job estimating data.—**Ingersoll-Rand Co., Phillipsburg, N. J.**

MOVALL DATA — "Movalls or End-Dump Trucks?" is the title of a 4-p folder that describes the advantages of the Movall. It com-

The 201-E is a highly portable plant. The frame is extra strong to hold rigid alignment of all equipment and drives. A rocker beam with full width axles supports most plant weight. Four wheels, each with dual tires, oscillate separately to compensate for rough terrain.

Push-button Controlled, Diesel Electrically Operated, and Portable AUSTIN-WESTERN 201-E high speed crushing plant

Need a high output, mobile crusher to furnish large quantities of accurately sized specification material at low cost? Then check the all new Austin-Western 201-E . . . Diesel electrified, push-button operated, portable, closed circuit crushing and screening plant.

Operation of all plant components is fully electric. Individual electric motors power all operations through short coupled V-belt drives. Mechanical loss through clutches, idlers, etc., is eliminated. Constant-top speed operations can be maintained at low cost.

A single, convenient push-button station controls the plant. Standard, interchangeable motors and electrical controls are used on the 201-E to eliminate costly down time.

Efficiency of the plant is increased by using these electric drives because all components operate at top efficiency at all times . . . regardless of crusher loads, thereby delivering top production of accurately sized aggregates.

These are just a few of the benefits that are yours with the *electrified* 201-E. Get the full story on the many ways this highly portable plant can boost your output of accurately sized specification material while cutting operating costs. See your nearby Austin-Western distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio, for illustrated booklet.

AUSTIN-WESTERN

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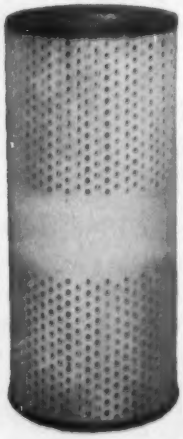
DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

103 drawbar horsepower is feature of new International TD-18A Diesel crawler.

What if dirty oil gets into the engine of a heavy-duty diesel like this?



A bearing can be worn seriously in a matter of hours if dirt-laden oil by-passes the filter and gets into a Diesel engine. This danger from by-passed, unfiltered oil is behind your International Harvester dealer-distributor's insistence that you use manufacturer-approved filter refills. He knows that they never get overloaded . . . never by-pass dangerous, dirty oil . . . never let harmful abrasives reach your engine. The reason is simple: they're built by Purolator to meet International Harvester's exacting requirements for every particular engine.

For the same reason, it pays to insist on manufacturer-approved filter refills for your Diesel. Its engine life depends on it.

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PUROLATOR PRODUCTS, INC., Rahway, New Jersey, and Toronto, Ontario, Canada

NEW PUBLICATIONS . . .
Continued

pares end-dump trucks and the positive-ejection Movalls on 11 different points. It is well-illustrated with on-the-job photos. Copies may be obtained by writing the factory and mentioning this magazine.—**C&D Div., Yuba Mfg. Co., Perkins, Calif.**

ALLIS-CHALMERS EQUIPMENT—A pocket-sized review of the entire line of earthmoving and construction machinery manufactured by Allis-Chalmers is now available. The new booklet, called MS-1107, presents the line through pictures of each tractor, motor grader, and motor and tractor-drawn scraper. Principal specifications are also included.—**Allis-Chalmers Mfg. Co., Tractor Group, Milwaukee, Wis.**

THREE-WHEEL ROLLERS—Buffalo-Springfield heavy-duty variable weight three-wheel rollers in the 10-14 and 12-15-ton classes are described in a new 12-p bulletin. The two rollers, models VM-31D and VM-32D, feature power roll brakes for the first time on three-wheel rollers. Tapered roller bearings on all rolls, compact four-speed transmission, improved hydraulic system, and low-torque clutches are other features.—**Buffalo-Springfield Roller Co., Springfield, Ohio.**

CAT CRAWLERS—"Let's Talk Tractors" is the title of a booklet describing Caterpillar D6, D4, and D2 tractors. Chapter headings include "How to Multiply the Work Power of a Tractor," "How to Prevent Down Time," and "How to Keep Machinery Young." A complete list of all available attachments, from spark arresters to windshield wipers, is also included. —**Caterpillar Tractor Co., Peoria, Ill.**

GIANT JACKS—A new 20-p booklet describes DeLong jacks and the De Long technique of dock construction, of which the famous Texas Tower is an example. Other illustrated De Long installations include piers, wharves and drilling platforms. The well-illustrated color booklet discusses installations already completed, and offers suggestions for new uses of De Long jacks.—**Mrs. Dorothy Duffy, De Long Corp., 29 Broadway, New York 6, N. Y.**

Continued on next page

Malsbary 250 HPC cleaner blasts heavy clay, grease and tar from earthmoving equipment; cleans grease and oil from parts, motors and tracks during overhaul; strips paint from used equipment for Frantz Tractor Co., Inc., Bronx, N. Y.

Look what you can do with a

Malsbary HPC Cleaner

If you own a Malsbary HPC (high pressure combination) cleaner you can use:

1. High pressure hot solution to 300-400 p.s.i. at 325° F. to soften and blast away waterproof greases, tars, corrosive oil and dirt.

2. High pressure cold water to 300-400 p.s.i. for rapid removal of caked mud and dirt, or cold rinsing after steam cleaning.

3. High pressure hot water to 300-400 p.s.i. at 200° F. to melt and remove ice and frozen mud, or to rinse equipment.

4. Low pressure wet steam (15-30 boiler hp.) to degas and clean tank interiors or for general heating and thawing.

5. Low pressure warm water for washing trucks, tractors, etc.

Malsbary 250 HPC completely cleans this shovel in 4 hours.

Cleans Faster Too—because Malsbary HPC cleaners combine pumped hydraulic and steam pressures (an exclusive, patented Malsbary feature), you have a cleaning force and range unmatched by any other steam cleaner on the market. A Malsbary HPC will handle any cleaning job twice as fast as any steam vapor cleaner (regardless of volume), and does most cleaning four to ten times faster. Try it.

You Can Reduce Downtime still further with big Series 300 and 500 HPC cleaners. They operate two or more guns simultaneously, one delivering high pressure cold water, the other high pressure hot solution—a real time saver on big rigs and fleets.

Can your steam cleaner handle all these cleaning jobs? If not, ask your Malsbary dealer to demonstrate an HPC cleaner on your job...or write us today for catalogs 250 and 500.

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MANUFACTURING CO.

Room C, 845 92nd Ave., Oakland 3, Calif.

82

A *Snap-on* Extra Heavy-Duty Ratchet Wrench provided ample tightening leverage and fast nut turning where bolt locations hindered the use of power tools.

An inspector okays bolt tensions after checking for accuracy with a *Snap-on* torqometer, which measures the exact torque applied to a bolt.

Photos courtesy of Russell, Burdsall & Ward Bolt and Nut Co.

Snap-on Tools

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Eighteen stories above New York's Park Avenue, where a slip could be serious, steel workers depended on *Snap-on* Extra Heavy-Duty Wrenches to help erect the city's first high-strength bolted building. This construction method speeded assembly, permitted use of smaller crews than needed for riveting.

Snap-on tools handled their share of the work, just as they do on a wide range of big construction projects. Men who work on these jobs know they can depend on *Snap-on* tools to give the leverage needed to tighten these bolts to proper tension, or to break loose rusted nuts and bolts on maintenance operations.

Each of our 48 branches carries complete tools stocks. Write for catalogs and branch addresses.

*Snap-on is the trademark of Snap-on Tools Corporation.

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NEW PUBLICATIONS . . .
Continued

PIPE INSTALLATION—"Transite Ring-Tite Pressure Pipe Installation Guide" takes up every step from receiving the pipe at the job to testing finished installations. It also has information on special situations such as bridge crossings. Over 100 photos illustrate the text. The 108-p manual is a handy 4½x 8-in. size so that it can be kept right at the job site.—**Johns-Manville, 22 E. 40th St., New York 16, N.Y.**

WELDING ACCESSORIES—Welding helmets, hand shields, electrode holders, weld-testing machines, goggles, filters, welding cable, and many other welding accessories are described in a 48-p catalog issued recently by Fibre-Metal Products Co. A section of the catalog is devoted to suggestions for safer welding techniques. —**Fibre-Metal Products Co., Chester, Pa.**

RUNWAY COATING—The use of synthetic rubber, blended with tar, to protect airfield pavements from the deteriorating effects of jet fuel spillage is described in an 8-p bulletin. The new bulletin, published by the Naugatuck Chemical Div., United States Rubber Co., gives detailed specifications of the tar-rubber coating.—**Lotol and Latex Sales Dept., Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.**

EUC REAR-DUMP—The new R-15 rear-dump Euclid is described in an 8-p catalog. Rated payload of the unit is 15 tons with 14.00x 24 tires, 18 tons with optional 16.00x25 tires. The three-color catalog illustrates the major design features of the new rear-dump and also provides performance data and general specifications.—**Euclid Div., General Motors Corp., Cleveland 17, Ohio.**

ASPHALT PLANTS—"Automation in Asphalt Plants' is the title of a bulletin just issued by Hetherington & Berner, Inc, manufacturers of asphalt mixing and paving equipment. The bulletin describes the automatic cycle control which is now furnished on H & B batch type plants. And other equipment that provides for automatic control of the entire mixing cycle with no loss of time between runs.—**Hetherington & Berner Inc., 701 Kentucky Ave., Indianapolis 7, Ind.**

Bethlehem Hollow Drill Steel shown biting into limestone at Reading, Pa., on a recent pipeline project for City of Reading, Bureau of Water.

8,355 cu yd of Limestone Moved for Pipeline in Eastern Pennsylvania

One of the tasks confronting Gilbert Associates, Reading, Pa., prior to the installation of a steel-pipe supply line for the City of Reading, Bureau of Water, was the removal of 8,355 cu yd of limestone.

The rock-removal, along the Schuylkill River at Reading, was handled by Berlanti Construction Company, Harrison, N. Y. The greater part of the drilling was accomplished with 1-in. hexagon and 1¼-in. round Bethlehem Hollow Drill Steel. Both carbide-insert bits and multi-use steel bits were employed. The approximate footage drilled was 4,000 ft, with the depth of the blast holes ranging from 4 ft to 14 ft. Drill steel fabricating and reconditioning was done by D. R. Buchert & Son, Inc., Reading, Pa.

For any type of rock-removal, you can always count on low-cost performance from Bethlehem Hollow Drill. This is because it is rolled from a special grade of steel which is resistant to fatigue. It has a wide quenching range, and is easy to heat-treat for the proper balance of toughness and wear-resistance, making possible long-wearing threads and strong shanks.

Bethlehem Hollow is furnished in rounds, hexagons and quarter-octagons, generally in lengths of from 18 ft to 25 ft. It also can be manufactured in longer lengths, to meet special needs. Use Bethlehem Hollow on your next drilling job. We think you'll like it.

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INTERNATIONAL® TRUCKS

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SOME BIG CONTRACT AWARDS OF THE MONTH

Booth & Flinn Co., 1942 Forbes St., Pittsburgh, Pa. General constr. for 450,000-kw Kammer plant to serve Olin Mathieson Aluminum plant at Clarington, Ohio at Moundsville, W. Va. for Cresap Operating Corp., 460 Park Ave., New York, N. Y. $60,000,000.

W. E. Wood Co., 4649 Humbolt St., Detroit, Mich. One-story 1,300,000-sq ft assembly plant, Farmington Brighton Expressway, Novi (Wixom), Mich. for Lincoln Div., Form Motor Co., Ben D. Mills, 6200 W. Warren St., Wayne, Mich. $25,000,000.

Lummus Co., 385 Madison Ave., New York, N. Y. and Triangle Constr. Co., Washington Square Bldg., Tallahassee, Fla. Cellulose pulp mill addition at Foley, Fla., for Buckeye Cellulose Corp. sub. Proctor & Gamble Co., Gwynne Bldg., Cincinnati, Ohio. $20,000,000.

C. L. Peck, 816 W. 5 St., Los Angeles, Calif. Aircraft assembly plant and service bldgs. at Long Beach Aircraft Assembly Plant C-8, Long Beach, Calif. for Long Beach Div., Douglas Aircraft Co., Inc., 3855 Lakewood Blvd., Long Beach, Calif. $17,000,000.

Cauldwell-Wingate Co., 101 Park Ave., New York, N. Y. Three-story arrival building with two airline wings, International Airport, Idlewild, N. Y. Port of New York Authority, 111 Eighth Ave., New York 11, N. Y. $16,350,000.

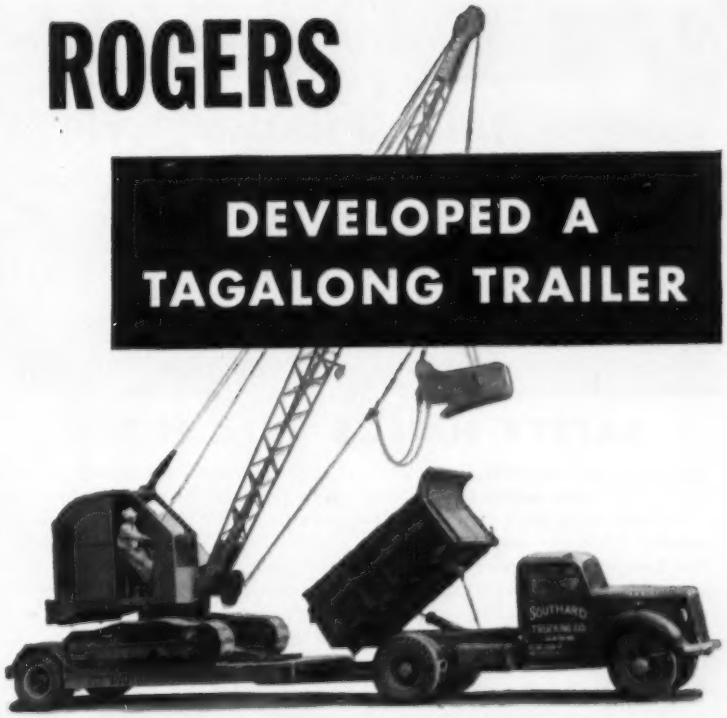
The Austin Co., 16112 Euclid Ave., Cleveland, Ohio. Design and construct plant, North Lake, Ill. for Automatic Electric Co., 1033 W. Van Buren St., Chicago, Ill. $16,000,000.

Del E. Webb Constr. Co., South 23 Ave., Phoenix, Ariz. Forest products plant, including lumber processing saw mill, drying mill, planing mill and moulded pulp plant at Red Bluff, Calif. for Diamond Match Co., 122 E. 42 St., New York, N. Y. $15,000,000.

Gibbs & Hill, Inc., Penn Station, New York, N. Y. Design and supervise construction, 105,000-kw addition Hardinong Street Steam Generating Plant, Indianapolis Power & Light Co., 17 N. Meridian St., Indianapolis, Ind. $15,000,000.

ROGERS

DEVELOPED A TAGALONG TRAILER



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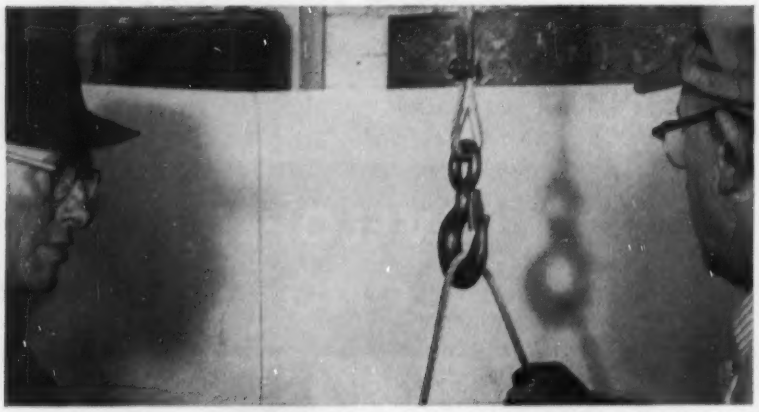

SAFETY HANGS BY A HOOK

It's small and relatively inexpensive, but a hoist hook carries the full load —as much as a crane is designed to handle! All hooks may look similar, but Laughlin hooks offer a combination of features that make them outstandingly safe. First, they are forged from special bar quality steel, then accurately heat treated; finally, Laughlin's precision die design controls the metal's grain flow during forming to keep the elastic limits of the hooks at their proper ratings.

Next time you need hooks remember that *safety hangs by a hook*—and Laughlin hooks are the safest!

THE RIGHT COMBINATION

An exacting combination of design, steel and drop forging goes into Laughlin Shackles. A combination that results in maximum strength without brittleness that can result in fracture under shock load or in extreme cold! Pins used in Laughlin Shackles are forged from the same high quality steel —their extra hefty design makes them safer when shock loads accidently occur. When you see the famous Laughlin trade mark on shackles (and all other Laughlin fittings), you're seeing the mark of safety! Your nearby Laughlin Distributor has shackles in sizes from 3/16" to 3".

LAUGHLIN LINKS INSTALLED QUICKLY

Lower downtime—fast changeover is reported by companies using super safe Laughlin Double Clevis Links to couple standard and alloy chains to fittings. Users everywhere have cut out expensive, time-consuming welding and blacksmithing in favor of simple installation. Laughlin's heat treated Double Clevis Link attaches 1/4" to

1/2" chain to rings, end and sling links, eye hooks, pad eyes, tractor eye bolts and other fittings.

The world's most complete line of fittings for chain and wire rope is described in the catalog available from your Laughlin Distributor, or Thomas Laughlin Division, American Hoist & Derrick Co., Portland, Maine.

SAFETY IN SIGHT

Ever worried about your crew forgetting the rated capacity of a block? You're free from worry and they're free from danger with Crosby "Load-Rated" Blocks because the load capacity is *embossed* in the side plates! A quick glance shows what the limits are —no chance to overload the block by mistake. Crews the world over are protected by Crosby "Load-Rated" Blocks —are yours? Crosby Products Division, American Hoist & Derrick Co., St. Paul 1, Minnesota.

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In excavating the marine channel on Galop Island in the St. Lawrence Seaway, millions of yards of heavy boulder-strewn glacial till are being moved under the toughest haul road conditions.

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Firestone nylon tires are built for severe service. The treads give maximum traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

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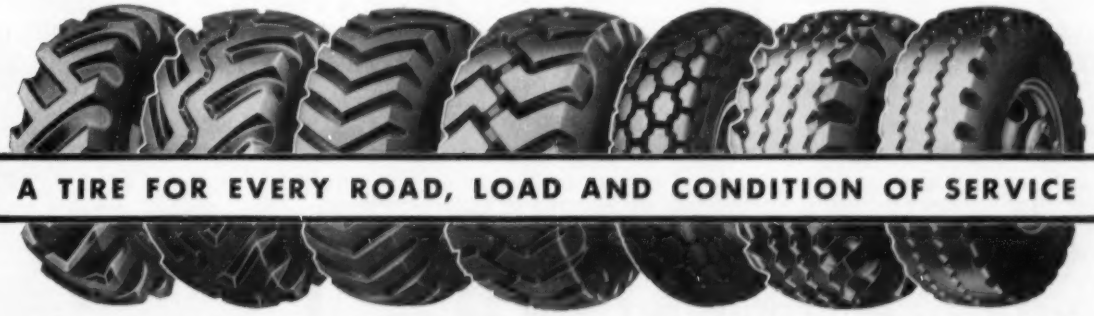
Let your Firestone Dealer or Store show you how Firestone nylon tires will cut downtime and increase the profits on your job.



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The ABP celebrates its Golden Anniversary this year. For fifty years, the Association has worked to bring about the evolution of the businesspapers from their humble beginnings to the powerful force they are today.

We take this opportunity to re-pledge our support of the high publishing principles for which it stands and to reassure you that we will always "consider, first, the interests of the subscriber".

CONSTRUCTION METHODS AND EQUIPMENT ABP ABC

A McGraw-Hill Publication, 330 W. 42nd Street, New York 36, New York

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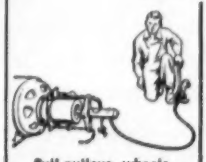
How Blackhawk Jacks Speed Pre-stressing

100 TONS OF FORCE FROM "PORTO-POWER" remote control jacks are the practical answer for pre-stressing concrete beams. Above —two Blackhawk hydraulic pumps transmit oil under pressure to rams — each of which can exert 50 tons of jacking power. Using an "I" beam as a crosshead, the rams are tensioning the cables after the girder is in place. Other "Porto-Power" jack sizes include 4, 7, 10, 20-ton capacities.

How "Porto-Power" jacks speed construction



Pull pulleys, wheels, gears. No damaging hammering and prying. Safe.

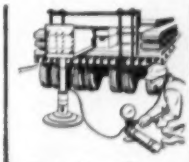
Straighten buckets — tons of force where you want it to push out bushes.

Straighten dented dump trucks—make repairs on the site to cut downtime.

Bend pipe the easy way. Equipment handles all popular pipe, conduit.

Toe-lifting heavy equipment. Easy with "Porto-Power" Ram, Toe Lift.

Pre-stress concrete girders, bridge slabs. Gauges measure exact pressures.



Test soil, road surfaces for weight bearing capacities; gauge shows load.

Do rescue work with hydraulic power that lifts, pulls, spreads, saves lives!

PREVENT COSTLY DOWNTIME — speed up construction in *hundreds* of ways! Above uses of Blackhawk "Porto-Power" are only a sampling. Maintenance is faster, easier . . . cutting downtime from hours to *minutes*. And only Blackhawk builds the *complete* line of hydraulic tools and attachments to answer needs for pushing, pulling, clamping, bending, spreading and pressing with tons of versatile power. See your Blackhawk construction equipment distributor *today*. Or write for free catalog H-201 — it's full of cost-cutting hydraulic power *ideas!*

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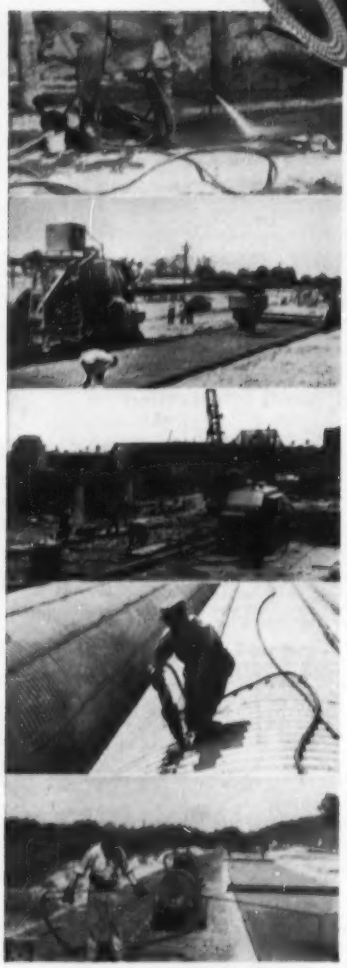

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"ALLSERV" will not only give long, reliable service on air and pneumatic tools, but will prove equally efficient in the handling of water, oil, gasoline, paint and insecticide spraying, grease guns, etc. The adaptability of this one hose to such a wide variety of applications provides a sure way to keep hose inventory low.

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CAREERS THROUGH MATH and SCIENCE

Parents . . . do you want to help your children choose their careers wisely? Then encourage them to take enough math and science in high school to qualify for *any* college courses.

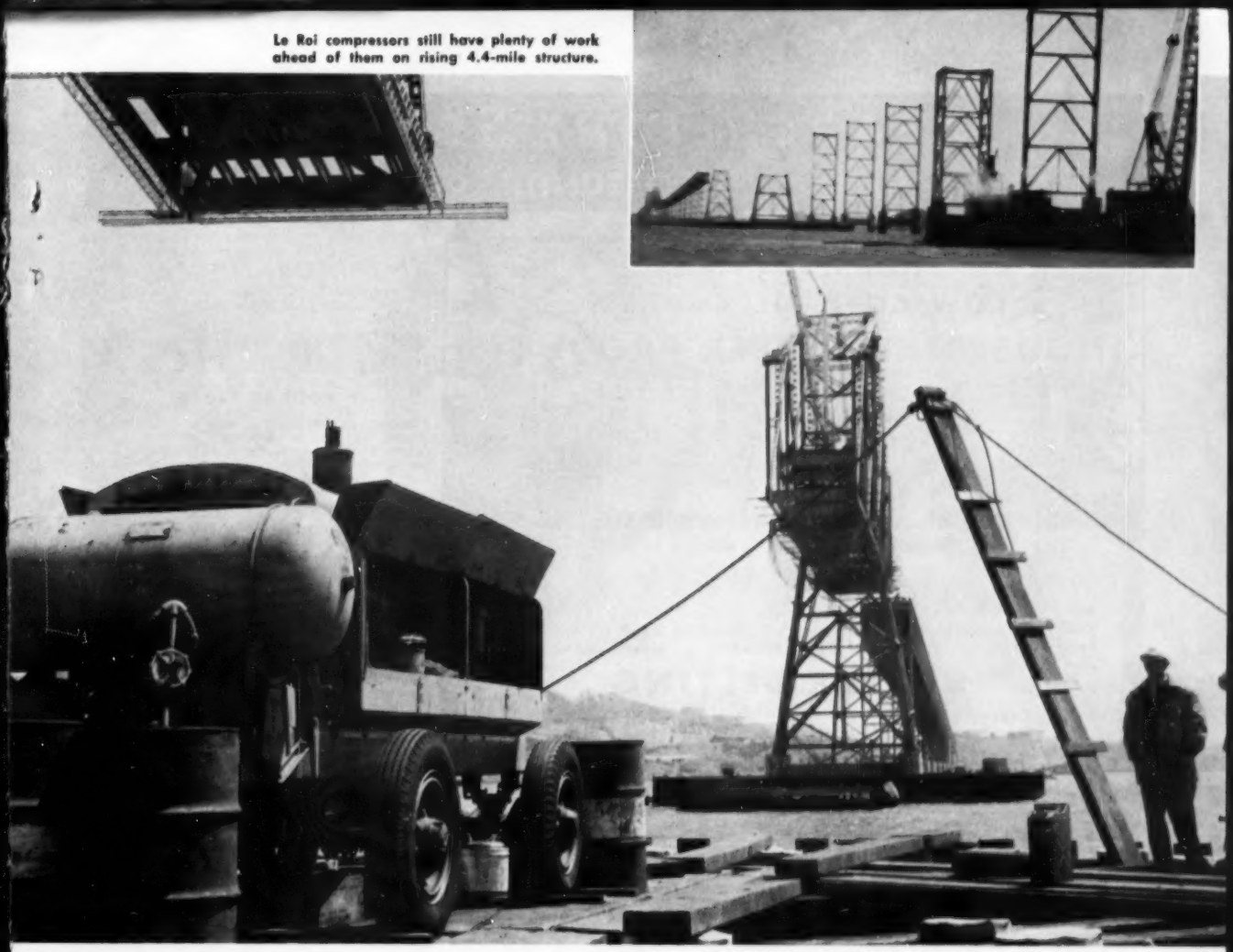
Most professions now require training in these subjects. To work toward a career as an engineer or scientist a good preparation in math and science is essential.

Remember—America needs engineers now and will for years to come.

Write for the free folder "After High School What?" c/o Box 40, Mid-Town Station, New York 18, N.Y.

Published as a public service in cooperation with The Advertising Council

Le Roi compressors still have plenty of work ahead of them on rising 4.4-mile structure.



Sea-Going Air Power Helps Assemble 4.4-mile Bridge

Air compressors are located at hard-to-get-at pilings

Some working more than two miles from land

Nearly a dozen Le Roi Airmaster compressors provide dependable power for air tools to speed steel assembly

Choppy waves and swirling currents tug at the pilings that support nearly a dozen Le Roi compressors. Gusty winds howl through the steel work high above the whitecaps. Yet progress is unhampered on the new $62 million 4.4-mile bridge across San Francisco Bay.

Dependability and easy starting of prime importance. The 600-cfm Le Roi compressors placed out in the bay provide air power for air tools used on steel assembly work along the 21,343-foot span. It's difficult to reach these units for servicing — yet reliable, uninterrupted performance is essential. That's why Le Roi compressors were selected. Exposed to driving, moisture-laden winds and piercing salt spray, these easy-starting, trouble-free air compressors keep plenty of air power moving through the hose. Further proof of the popularity of Le Roi compressors in the "Bay" area is found in the fact that Clementina Ltd. uses a fleet of 120 Le Roi's for rental purposes.

A new method of handling long trusses was developed. Because of the high winds and tricky tidal currents, a set of 280-foot aluminum-alloy supporting spans was built which allowed on-site erection of the permanent steel spans.

Second largest bridge. Contractors on this new bridge to link Richmond and San Rafael, California are Judson Pacific, Murphy, Kiewit. The huge 4.4-mile span is surpassed only by the famed San Francisco Bay Bridge. Highest tower on this new structure rises 325 feet above the water.

Use Le Roi air power on all your jobs for reliable performance under all conditions. See your Le Roi distributor today.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

RD-83

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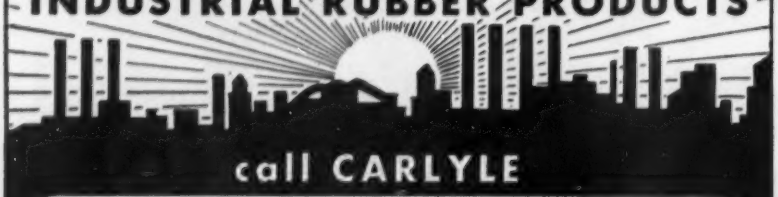

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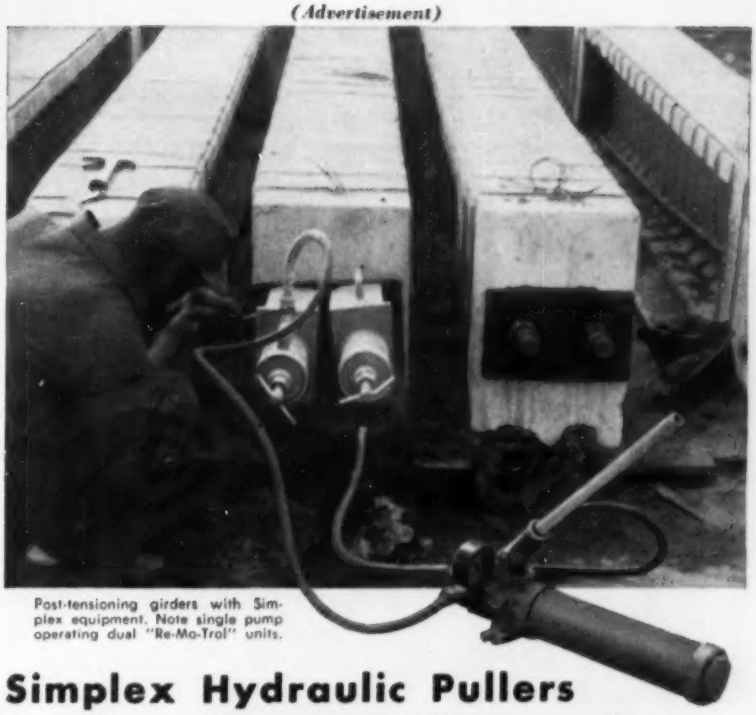


Post-tensioning girders with Simplex equipment. Note single pump operating dual "Re-Mo-Trol" units.

Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Pre-tensioning and post-tensioning concrete becomes a quick, easy task with Simplex hydraulic equipment. Because of the "center-hole" pulling feature of Simplex units, wires, rods and cables can be tensioned without torque, "off center" pressures or complicated back-up devices. Eliminating these factors accounts for a 75% increase in ease and efficiency.

Simplex "Re-Mo-Trol" units consist of a "center-hole" hydraulic pulling ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated safely from any nearby, convenient location.

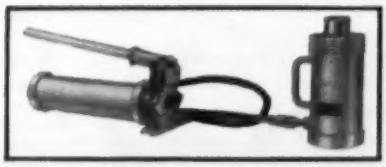
"Re-Mo-Trol" hydraulic pullers are ideally suited to prestressing operations at the job site and for use in permanent pre-tensioning beds. These versatile Simplex units are available in standard capacities from 10 to 100 tons, and can be used for heavy tonnage high-pressure tensioning of cables, rods or wires or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custom-built units are available up to 600 ton capacity.

Another Simplex hydraulic puller, the "Jenny", is a self-contained unit which serves as its own back-up or can be used with a simple chair to reduce set-up time.

Either device can be used not only as a puller but as a hydraulic jack or press for moving heavy equipment and the like.

For detailed data on the selection and application of Simplex Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL"—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

SIMPLEX "JENNY" is a hydraulically operated center-hole puller which also serves as a press or heavy duty jack. It is a self-contained unit available in capacities from 30 to 100 tons.

TEMPLETON, KENLY & CO.
2509 Gardner Road • Broadview, Illinois

Methods Memo . . .

Building Safety

That man in the strange looking get-up is Eugene Swarz of the New York State Insurance Fund. He is demonstrating the right and the wrong way to lift heavy objects to a group of employees of Hendrickson Bros., Inc., of Valley Stream, N.Y. His costume shows what muscles can take the load, where strains may occur.

The demonstration was part of a regular Hendrickson safety meeting that was reenacted for the Construction Session of the Greater New York Safety Convention. The workers (left) are the same who attended the actual safety meeting a few weeks earlier.

Hendrickson holds a safety meeting for each trade group about once a month in a hall at company headquarters. Program includes movies, slides, talks and demonstrations by outside safety experts. After the meeting, the company serves refreshments.

Workers are encouraged to take an active part in the meetings by raising questions. Attendance is not compulsory; the meetings are held at night, not during working hours. But they are popular with the workers and well attended.

Milton Hendrickson, president of the firm, says the proof of the value of these meetings is that they are paying off in lower accident—and insurance—rates.

Record Job

What may be the biggest competitive bid ever submitted by a single company for a construction contract is Merritt-Chapman & Scott Corp.'s $92 million low bid for construction of Priest Rapids Dam on the Columbia River.

The Public Utility District of Grant County will sponsor the big flood control, navigation, and power project 125 miles southeast of Seattle, Wash. The District has approved the M-C&S bid and issued a letter of intent.

Four other bids for the job all came from joint venture combinations of 28 major construction firms from all parts of the country. M-C&S was lower than the next low bid by more than $1 million.

Project calls for construction of an 8,412-ft reinforced concrete and earthfill dam with a maximum height of 175 ft from the deepest excavation. Its 1,142-ft reinforced concrete spillway section will contain 22 gates, each 50x40 ft. A powerhouse 900x205 ft will have eight 78,850-kw generators.

A Better Pneumatic Hammer

Researchers at the Illinois Institute of Technology are working out a way to make it easier to operate a pneumatic hammer. They have learned how to eliminate the jolting recoil of the hammer by placing a pneumatic spring between the handle and the hammer itself. The spring absorbs the recoil.

It will be some time, however, before such improved hammer can go into production. Dr. Gerhard A. Norhmann, manager of the Institute's Armour Research Foundation, says still more research is needed to make the improved hammer deliver the same work as a standard hammer with no increase in weight.

He's confident that can be done. "Careful redesign and proper choice of materials," he says, "can produce a balanced design which will be sufficiently rugged and of acceptable weight, including the parts added to produce the vibrationless feature."

Just Dressing It Up

We aren't changing our name, but it is going to look a bit different. Beginning next month, here's how it will appear on the cover and inside the magazine. We slip you this preview so you'll know us when you see us next.

Construction Methods AND EQUIPMENT

SANTA FELICIA DAM

Santa Felicia Dam, Piru, California. Views are of concrete spillway under construction. Dam is earthfill. United Water Conservation District, Santa Paula, Calif. Contr.—D. & H. Construction Company, Sacramento, Calif.

POZZOLITH employed in concrete for optimum quality and economy

POZZOLITH

the key to control of—

- ★ water content
- ★ entrained air
- ★ rate of hardening

Lowest possible unit water content for a given workability, and rigid control of entrained air and rate of hardening are important advantages of Pozzolith in obtaining uniform, better quality concrete and reduced costs.

Pozzolith was used in the concrete for Santa Felicia Dam to improve workability of the mix, making possible a reduction in unit water content. As the result of reduced unit water content, required strength was obtained at lower cost and other properties of the concrete were improved.

In the construction of many dams the world over, as well as other types of concrete work, Pozzolith has proved a valuable aid in economically obtaining uniform, better quality concrete with available materials. This is because Pozzolith provides the three controls required for optimum concrete performance. (See left.)

Ask us to demonstrate the advantages of Pozzolith controls for your project. Also send for copy of 48-page illustrated booklet "Master Builders Reporter on Hydraulic Projects."

COLORED MOTION PICTURE, "The Man With The Trowel", shows how Pozzolith greatly improves your control of concrete quality. Film available for private showing to groups of any size.

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Division of American-Marietta Company

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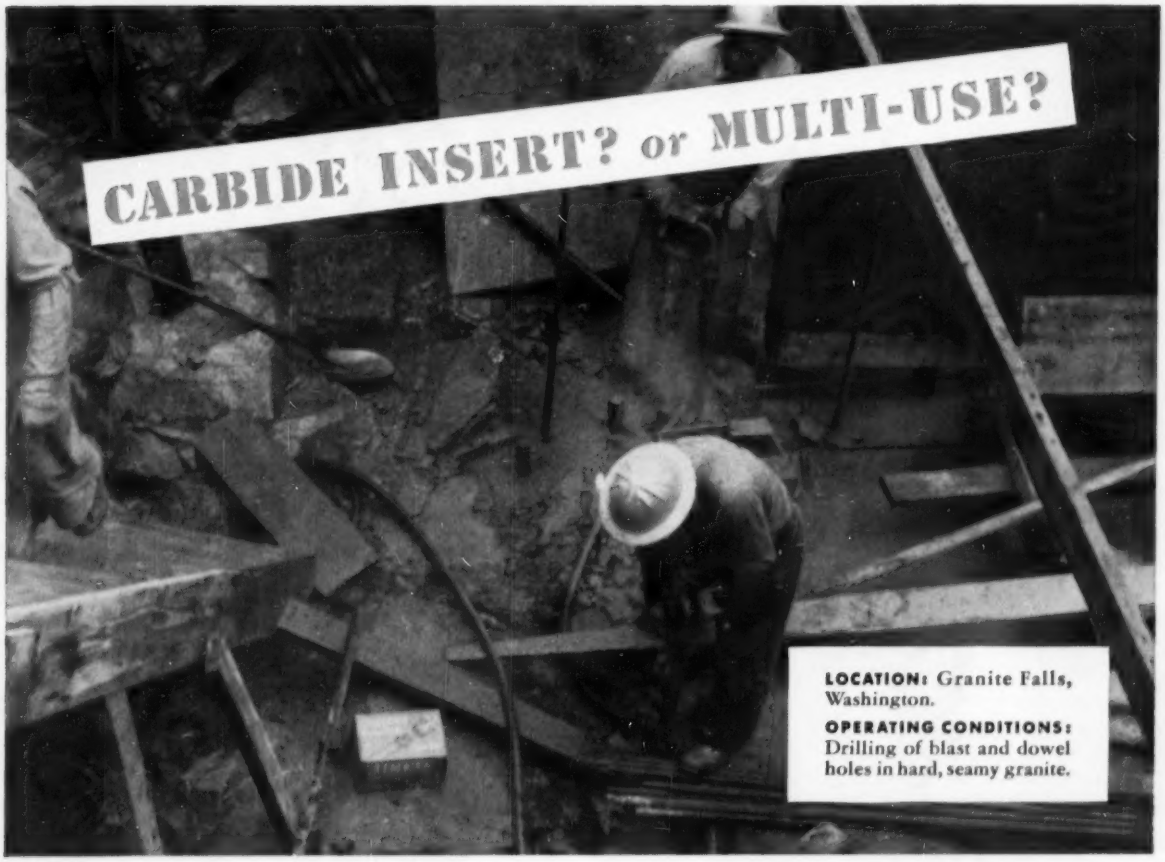
CARBIDE INSERT? or MULTI-USE?
LOCATION: Granite Falls, Washington.
OPERATING CONDITIONS: Drilling of blast and dowel holes in hard, seamy granite.

TIMKEN® carbide insert bits give more hole per bit through blocky granite on Granite Falls Fishway

THE Scheumann & Johnson Company of Seattle had to drill blast and dowel holes in extremely hard, seamy granite when constructing baffles for the world's largest "vertical-baffle" salmon fishway at Granite Falls, Washington. For highest economy drilling through this hard ground, they chose Timken® *carbide insert* bits for the job.

Timken carbide insert bits permitted high speed drilling with minimum bit changes. And the job superintendent reports that the Timken carbide insert bits made it possible to drill out full increments of drill steel.

But Timken carbide insert bits may not be the best answer for *all* your drilling problems!

In softer, less abrasive ground, Timken *multi-use* bits, correctly controlled and reconditioned, give you the lowest cost per foot of hole when you can drill out full increments of drill steel.

Both types of Timken bits are interchangeable in the same thread series. And a wide range of different Timken bits fit the same drill steel. When the ground changes, you can switch bits quickly and easily, right on the job.

The Timken Rock Bit Engineering Service can offer you over 20 years of experience in recommending the best bit for the job. We'll be happy to help you. Write: The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

your best bet for the best bit ... for every job

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